Intensive Readings to Develop the Use of Language of Learning (CLIL):

An Action Research on Science Content Classes

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Declaration

I hereby declare that my research report entitled:

Intensive Readings to Develop the Use of Language of Learning (CLIL): An Action Research in Science Content Classes

- is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared and specified in the text;
- is neither substantially the same as nor contains substantial portions of any similar work submitted or that is being concurrently submitted for any degree or diploma or other qualification at the Universidad de La Sabana or any other university or similar institution except as declared and specified in the text;
- complies with the word limits and other requirements stipulated by the Research Subcommittee of the Department of Foreign Languages and Cultures;
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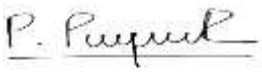
Signature: 

Acknowledgements

The pathway of this enriching academic journey has been full of bumps and turns which have convinced me that I am not hardwired for independence. Gladly, I must declare my dependency, and even though this might sound as a weakness, it was truly my strength. I have learned that I needed my family to cheer me up along the way; I understood that my professors were an invaluable source of strength and wisdom, and I realized that my colleagues provided me with the motivation to keep on learning. Also, I am most grateful to my fellow classmates for their unselfish support, and especially to my friend, Adriana, who was always there for me. I would like to thank my mom and dad for praying for me, but most of all, I would like to thank my God Almighty who has always blessed my path and has taught me to always claim my dependence on Him.

Abstract

Bearing in mind the importance of language and content teaching in bilingual schools, it seems imminent to offer teachers the tools necessary to provide not only content instruction but also language teaching. The purpose of this small-scale action research was to determine the effects of the use of Intensive Readings (IRs) focusing on the language or learning component (CLIL), that is, the specialized vocabulary needed in science classes as a strategy to help content teachers improve their pedagogical practices when integrating language, more specifically, the specialized vocabulary, as they introduce content. The study was conducted with a group of seven in-service Science teachers with a B1-B2 level (CEFR) L2 English. The participants faced difficulties trying to incorporate language instruction into their content lessons. Data were collected from five instruments: IRs worksheets, lesson plan checklist, teacher observations, questionnaire, and the researcher journal. The results revealed the IRs influenced the teaching of the language of learning, that is the specialized vocabulary needed in their Science classes: Teachers evidenced a transition from using readings only to teach the content to use readings to also introduce the specialized vocabulary, there was also an intentional inclusion of the specialized vocabulary, and lastly, the participant teachers became aware of the value of sharing teaching strategies during the implementation sessions. Such findings provided the reasons to obtain the core category: *the potential breakthrough of specialized vocabulary teaching*. This present study contributes to the content and language instruction as it showed how the use of intensive readings influenced participants' teaching of the language of learning, and how the sharing of strategies among teachers helped make a difference in the inclusion of the specialized vocabulary into their lessons.

Key words: Intensive Readings; Language of Learning; CLIL; Vocabulary instruction.

Resumen

Teniendo en cuenta la importancia de la enseñanza del lenguaje y del contenido en los colegios bilingües, se hace inminente ofrecer a los docentes las herramientas y el entrenamiento necesario para proporcionar no solo la enseñanza del contenido, sino también la del idioma. El propósito de esta investigación acción es determinar los efectos del uso de lecturas intensivas en las clases de Ciencias Naturales como una estrategia para ayudar a los profesores de contenido a mejorar sus prácticas pedagógicas al integrar el lenguaje, más específicamente el vocabulario especializado, a la vez que se enseña el contenido. El estudio se realizó con un grupo de siete profesores de Ciencias Naturales con un nivel B1-B2 (MCER) L2 en inglés. Los participantes enfrentaron dificultades al tratar de incorporar la instrucción del idioma en sus lecciones de contenido. Los datos se recopilaron de cinco instrumentos: hojas de trabajo de lecturas *Intensive Readings*, IRs (por sus siglas en inglés), lista de verificación de las planeaciones, observaciones a clases, cuestionario y el diario del investigador. Los resultados revelaron que los IRs influyeron en la enseñanza del lenguaje del aprendizaje, que es el vocabulario especializado que se necesita en sus clases de Ciencias: los maestros evidenciaron una transición de usar las lecturas solo para enseñar el contenido a usar las lecturas para introducir también el vocabulario especializado, también hubo una inclusión intencional del vocabulario especializado y, por último, los profesores participantes entendieron del valor de compartir estrategias de enseñanza durante las sesiones de implementación. Tales hallazgos proporcionaron las razones para obtener la categoría principal: el avance potencial de la enseñanza de vocabulario especializado. Este estudio actual contribuye a la instrucción del contenido y el idioma, ya que demostró cómo el uso de las lecturas intensivas influyó en la enseñanza de los participantes sobre el lenguaje del aprendizaje y cómo el compartir estrategias entre los maestros ayudó a marcar la diferencia en la inclusión del vocabulario especializado en sus lecciones

Palabras claves: Lecturas Intensivas; *Language of Learning*; AICLE; Enseñanza del Vocabulario

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Chapter 1: Introduction

1.1 Introduction to the study

The world of bilingual teachers continues to evolve rapidly, demanding not only more thorough preparation but also better teaching techniques. Content and language in-service teachers are facing difficulties identifying and planning language objectives when providing for their students' language needs (Baecher, Farnsworth, & Ediger, 2014). Among the many changes, teachers are looking at more "forms of immersion and content-based language teaching" (De Bot, 2007, p. 276). Teaching the content becomes challenging when trying to find activities that would help introduce the language.

Specific needs arise when in content classes; language is neglected or not properly attended. Among those needs is a lack of necessary language to understand the content class or communicate subject-related ideas; hence, the need to engage teachers, and encourage them to improve their practice. This small-scale action research project used a group of content-based in-service teachers in science classes who potentially will teach not only content but also aspects of the language as they apply intensive reading (IRs) into their classes.

This brings about the need to search for further training and constant improvement. Even though teachers' development is said to be a difficult construct to be defined, there have been attempts to describe it as the on-going learning process, which allows the teacher to follow the steps of acquiring new ideas, applying those ideas, and sharing the results of such ideas with other colleagues (Evans, 2002). Diaz Maggioli (2003) defines teacher development as the "ongoing learning process in which teachers engage voluntarily to learn how to adjust best their teaching to the learning needs of their students" (p.1). This type of voluntary engagement is the key element that could help teachers be more successful at integrating the language.

To understand that teachers must be in continual training and growth and that schools play a significant role in that training, schools must provide them with new teaching approaches, and strategies. Hillyard (2011) notes that the best way to keep teachers motivated is having a well-structured and planned implementation of programs and strategies, that will allow academic coordinators along with content teachers to keep the right balance between content and language teaching. It becomes essential for schools to provide content-based language in-service teachers with efficient tools and strategies to strengthen their classes (Pérez Agustín, 2019; Pérez Cañado, 2016). The on-going training process for content-based in-service teachers is essential for the accurate language integration in content classes especially for those teachers with little or no practice teaching.

When the purpose is to bring meaningful teaching into the classroom and connect it with content learning which consequently could connect to the progress of the language, then Content and Language Integrated Learning (CLIL) becomes the most appropriate approach (Coyle, 2005; Dalton-Puffer, 2011; McDougald, 2016a). CLIL is by definition the dual-focused approach that aims to teach both language and teaching (Coyle, Hood, & Marsh, 2010) which proposes the teaching of language of learning, that is the language needed to understand the content of the subject.

Many schools, in their desire to offer more comprehensive bilingual programs, have undertaken the CLIL language teaching approach without recognizing the in-service teacher profile needed to guarantee the successful implementation of such programs. McDougald (2015) argues that teachers in Colombian schools, which aim to implement language content lessons in their curriculum, lack accurate training and guidance. Content teachers have been thrown into the arena so as to “tame a bull” that brings many challenges: a foreign language, new programs, and

time issues Although most in-service teachers are intrigued by the challenge to teach in an L2, they have found difficulties to maintain the balance of teaching language as well as their content classes. De Bot (2007) suggests that most language learning happens "the sneaky way" (p. 276), that is, when students learn the language without even noticing and they are only focused on the content class, it is essential for in-service teachers to be fully aware of how their students are acquiring language.

1.2 Rationale for the study

1.2.1 Rationale for the problem of the study

1.2.1.1 Needs analysis and problem statement

This research was conducted with a group of seven science bilingual teachers of students ranging from first to eighth grade at a private school on the outskirts of Bogotá, Colombia. Their average teaching experiences ranged between 0-4 years, and their English level varied between a CEFR B1-B2. B1 is considered an intermediate level that allows the speaker to communicate on familiar topics, understand main points and give brief reasons and explanations. A B2 level is an upper-intermediate level that allows the speaker to use more complex language with a broader knowledge of vocabulary and fluency (Council of Europe, 2001). The participant teachers' English level provides a target language background that plays an important role in their bilingual lessons suggesting a possible challenge when introducing language into their content classes (Pavón Vázquez & Ellison, 2013). Due to time reasons, this study focused on science teachers but aims to have the qualities of transferability, being able to be applied to other content classes. As this private school (see more details in **¡Error! No se encuentra el origen de la referencia.**) began to implement a new international curriculum, language and mainly content teachers were hesitant to face the language issues that would come up in their classes. The school

adopted the Cambridge Assessment International Education curriculum, implementing a combined bilingual program that would serve both the national and international requirements (Stobie, 2013). The mapping of the two curricula demands, not only an integrated and flexible program but also faculty members ready to engage in bilingualism. Cambridge International considers every student needs to learn the language in every class and every teacher is eventually a language instructor, concluding that "the inclusion of learning through English becomes an integral component in the study of a [non-language subject]" (Stobie, 2013). Therefore, bilingual teachers facing this double-curricula challenge needed to have the support and guidance to become effective teachers. The effective teacher, in this case, can teach the vocabulary needed to understand the content and the language needed for the subject class. In order to conduct this study under strict ethical considerations, letters of consent from the vice-principal of the school and the teacher participants were provided (see more details in **¡Error! No se encuentra el origen de la referencia.**.). As part of the needs analysis, two instruments were applied, a focus group session with students (See Appendix 0) and a questionnaire designed for content teachers (see Appendix 0). The questionnaire was designed to obtain not only objective data but also to identify teachers' beliefs on self-efficacy and students' attitudes towards content lessons. At the same time, to know students' perceptions of the teaching of language in content classes, a group of 10 students from sixth to eighth grade was interviewed in a focus group. Still, only less than 10% did not feel they had the language expertise to teach their content classes in English. Then, when asked about their English level, 56% of the in-service teachers believed they were at a B2 level. However, as the researcher accessed teachers' files, only 33% hold an official certification of a B2 (CEFR) level (Council of Europe, 2001). The

results showed teachers had some self-confidence that could help them deliver their lessons and also, that teachers were not fully aware of their own linguistic needs. 0

Based on the results of a focus group, students explained that they would normally be given a list of words to use, and in most cases, the meaning of the new vocabulary was not thoroughly learned. Students also expressed that they did not have any kind of reading or vocabulary activities in content classes. On the other hand, social studies classes appeared to be more interesting, as the students had the opportunity to have more interactive oral communication in class and could use more content vocabulary, but the reading comprehension activities were few, and there was almost no writing work done in the target language.

The needs analysis showed content teachers were not aware of their own linguistics needs, and the needs analysis done through a focus group, also revealed that students were somewhat discouraged with their content classes, and did not perceive to have language support from the teacher. Addressing such a broad problem, compelled the researcher to focus on one specific area of the language instruction in content classes; this study focused on the language of learning, more specifically, vocabulary difficulties content and language in-service teachers have when teaching language aspects in their content classes.

1.2.1.2 Justification of problem's significance

The increasing need to be more innovative in the classroom and to have a more global education has taken many Colombian schools, as it did in Europe, to introduce content-based classes in the curriculum and provide students with more exposure to the English language (Xerri, 2015). Content and language integrated learning (CLIL) is a dual-focused approach that uses content to teach language and vice-versa, and various schools have been taking this approach to increase the English exposure of the students to the language (Banegas, 2015;

Dalton-Puffer, 2008; Rodríguez Bonces, 2011). Although such exposure would be beneficial for the students' acquisition of the language, this needs to happen with the necessary training (Hillyard, 2011; McDougald, 2016b).

Teaching language effectively in content classes is a significant need which could be met by improving teachers' language of learning (that is the obligatory content language pertaining the discipline being taught) (Coyle et al., 2010), to increase the teaching of language in content classes (Rodríguez, 2012). The school's responsibility is to provide much-needed training and support providing teachers with strategies and ideas to help them incorporate the teaching of the language into their content lessons. In this study, the need content teachers have is the lack of specific and clear language teaching in content classes, which may disrupt the learning process of the students resulting in the low acquisition of the content as well as of the language (B. A. Mohan, 1979).

1.2.2 Rationale for the strategy selected to address the problem of the study

Being effective when teaching language in a content class would require not only training for teachers but also specific language strategies and tools that might allow teachers to provide the students with the material necessary to learn both content and language (Coyle, 2005; Pérez Cañado, 2016). If there were language objectives in content classes, there would be clearer performances and activities that could help teachers and students reach the desired language aims (Sepešiová, 2015). This study focused on using intensive content reading material with science content teachers to improve the teachers' language abilities and mainly to bring awareness on how to include the instruction of specialized vocabulary into their classes, and Intensive Readings (IRs) was considered to be an effective strategy since language-content students have

a tendency to develop better receptive skills such as reading comprehension, and vocabulary acquisition (Ruiz de Zarobe, 2008).

Reading helps students (in this case, the participant teachers) to construct meaning while extracting information from texts and including strategies such as using their previous knowledge to be able to understand a written text (Shen, 2008). Students develop strategies to approach a text which later become skills that guarantee a better level of comprehension, better use of structures and vocabulary (Jiménez, Victoria, & Iragi, 2013). IRs are the type of readings that demand attention to the details of the text. The purpose of such readings is to take a close look at meaning and structure (Carrell & Carson, 1997). According to Nuttall (1996), the goal of IRs is to understand the meaning of the text and how that meaning is produced. The aim of IRs is a precise understanding of the text. Content-based teachers would be able to integrate language in their content classes as they used IRs to focus on language issues, at the same time they teach content.

The use of IRs is crucial to improving both language and knowledge of the content area and, more specifically, vocabulary and reading comprehension (Erfanpour, 2013). IRs could help the students focus on the form of the language focusing on accuracy (Tuğrul Mart, 2015). Such attention could bring as a result more intentional learning of the language and vocabulary needed in content classes. Long (1998), argues that activities leading to focus attention to form could help students retain the language over time. Students could learn to identify specific aims and details in the content area.

Consequently, this study selected IRs as a strategy to help teachers with the acquisition of the language of learning, that is, the specialized vocabulary needed in their science classes. Also,

IRs would help teachers as they become acquainted with how to introduce language in their content classes.

1.3 Research question(s) and objective(s)

The objective of this study was to analyze what happens to the language of learning in content classes when science teachers are exposed to IRs. Therefore, the research question that guided the study was: How do intensive readings influence the language of learning of in-service science teachers with a B1-B2 level (CEFR) L2 English?

1.4 Conclusion

De Bot (2007) claims that teachers are recommended to grow at the same pace the world has been evolving. Students need to develop competencies that can help them keep up with globalization, and classes must supply those content and language necessities (Jiménez et al., 2013). To match students' needs, every in-service teacher is called to be aware of his learning and training process, in which growth requires new strategies and teaching techniques that would comfortably allow them to be effective when facing the challenges of a content and language class (Diaz-Maggioli, 2003).

The language and content in-service teachers were given a new international curriculum to be taught in English but their language level and lack of experience lead them to face fears that later translate into discouragement when trying to teach content and language in their classes (Hillyard, 2011). Providing specific strategies such as IRs to incorporate language could result in more engaged teachers who will later make adjustments to the strategies used in their classes. Furthermore, this would help teachers maintain a balance between content and language instruction (Coyle, 2015).

The purpose of this small-scale action research was to determine the effects of the use of IRs in science classes as a strategy to help content teachers improve their pedagogical practices when integrating language and content. Intensive readings are characterized by focusing on types of texts that aim at specific language and structure needed to enrich content classes (Nuttall & Alderson, 1996). As a basis for the implementation of this study, it was essential to define in the following chapter, the constructs that helped identify the strategy (intensive readings) and the problem (the language of learning, CLIL), as in-service teachers were observed developing the competence (vocabulary) in content-based classes.

Chapter 2: Literature Review

2.1 Introduction

Language and content instruction has become a familiar approach where bilingualism is not only about teaching a second language but also teaching what to do with the second language being learned (McDougald, 2015). Among the many difficulties that could arise with the implementation of this teaching approach comes the need to implement more assertive strategies that would challenge teachers to teach their content along with the language (Ruiz de Zarobe & Lasagabaster, 2011). Teaching the content without sacrificing the language is the balance in a dual-focused approach that allows students to enhance their linguistic and interdisciplinary competences (Jiménez et al., 2013).

In order to help teachers reach that appropriate balance, teachers must be confident with the use of specialized vocabulary (Coyle et al., 2010), which is the language learners need to understand the content (Snow, Met, & Genesee, 1989). To increase teachers' awareness of the language of learning (Coyle et al., 2010) (more specifically the specialized vocabulary needed)

and, thus, become more effective at the instruction of language in their content classes, the researcher provided a set of Intensive Readings. IRs are characterized by being short specific readings that focus on structure and vocabulary, which could help teachers "arrive at an understanding, not only of what the text means but of how the meaning is produced" (Nuttall & Alderson, 1996, p. 38). Even though there have been several studies done on the use of readings in content classes and IRs (Leader-Janssen & Rankin-Erickson, 2013; Park, Isaacs, & Woodfield, 2018; Shen, 2008), little research has been done concerning the impact it has on the specialized vocabulary instruction needed in a content class.

The following theoretical review clarifies how the concepts of vocabulary instruction, the language of learning, and IRs were used in this study. Dalton- Puffer (2010)states the general concern content teachers have when facing the challenge of teaching their subject matter without neglecting linguistic needs. This study suggests using strategies in class that would help teachers become more aware of the specialized vocabulary needed as they teach their content.

2.2 Theoretical framework

2.2.1 Language of Learning

Coyle, Hood, and Marsh (2010) characterize the Greek term *synergos*, as implying multiple parts working together to attain a bigger goal. CLIL is the combination of two concepts that bring about a bigger whole. CLIL is a teaching approach that allows the teacher to expose students to a content and language curriculum or target language, enabling their pupils to develop skills to combine these two concepts, bringing about pluriliteracies in which concept and communication learning come together (Coyle, 2015; Graddol, 2006).

The CLIL approach is not simply the teaching of a specific discipline in a foreign or second language. Coyle et al. (2010) maintain that CLIL is a teaching approach aiming to

develop thinking and learning skills that will allow students to share and build knowledge with their peers. The quickness of the impact of globalization means learners need to have more accessible language training (Coyle et al., 2010), and new teaching approaches. Languages become the key to access knowledge in a multilingual world that offers the possibility of a more successful and enriching life (Marsh, Maljers, & Hartiala, 2001).

CLIL lessons are characterized by the different opportunities presented to the learners to engage in their learning. Learners and teachers should engage in a communicative exchange of ideas and new knowledge, promoting interaction (Coyle, 2007). To be successful in this engagement, learners would need to be exposed to the required language that would help them acquire the subject matter (Coyle et al., 2010).

Coyle, Hood, and Marsh (2010) present the Language Triptych as a representation of the connection between the content and the language objectives of a CLIL class.

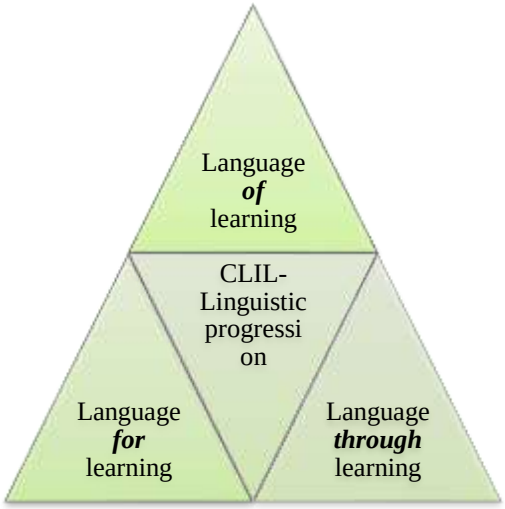


Figure 1. Language Triptych (Coyle et al., 2010, p. 60)

The Triptych describes the use of the vehicular language in three perspectives. First, the *language of learning* is the language necessary to understand concepts related to the subject. This language is closely related to the vocabulary or grammar needed to learn the content. It

includes the content obligatory language which implies the structural and functional language the student needs to successfully learn content (Snow et al., 1989). An example of this type of language in a social studies class activity is the use of a worksheet introducing vocabularies such as *Civilization, Hunter gatherers, Agriculture, Trading, or Hieroglyphic*

Second, *language for learning* is the language the learner needs to work with his peers, debate, or ask questions. That is the language necessary to perform activities in the classroom more effectively. Such is the language needed for classroom communication that provides collaboration in the construction of meaning as students engage in social interaction between peers and teachers (Moate, 2011). A clear example could be the language needed to exchange information as they work in groups and prepare infographics. (*What information did you find?, What pictures should we include?, Who should do the presentation first? In this presentation, we will talk about…Did you know…*?). Third, *language through learning* is the language students use to express their understanding; the language acquired and developed while learning the content. This is the language students use to express new ideas that emerged from the knowledge already acquired. Students can evidence the improvement of their linguistic competence in the target language (Lasagabaster & Doiz, 2016). An example is a language needed to provide explanations of their infographics (oral description of civilizations to class).

This study focused on the language of learning, and more specifically, on the specialized vocabulary in science classes. Morton (2015) explains the need for content classes to provide a richer lexical development in the target language. The explicit integration of specialized vocabulary in content classes using IR's was a proposed strategy to help teachers and students, identify the essential vocabulary needed for content science classes.

2.2.2 Vocabulary Instruction

The acquisition of a second language heavily relies on the learning of vocabulary (August, Carlo, Dressler, & Snow, 2005; Graves, 1986; Nagy & Townsend, 2012; Restrepo Ramos, 2015), and the teaching of vocabulary has gained recognition among teachers. Nation (2008) highlights four important jobs the teacher has when introducing vocabulary in a language class: planning, training, testing, and teaching. If there is vocabulary instruction, there will be language use, which, at the same time, will allow the learners to continue increasing their lexis as they communicate (Gierlinger & Wagner, 2016; Nation, 2001; Vadasy, Sanders, & Logan Herrera, 2015; VanDe Weghe, 2007).

The learning and teaching of vocabulary have relied deeply on the context of reading (Jenkins, Stein, & Wysocki, 1984; Taboada & Rutherford, 2011). Among the many benefits of reading is the learning of new vocabulary which is one of the essential elements for efficient reading instruction (Johnston, Mercer, & Geres-Smith, 2018; Sanad & Gaber, 2017). Such learning could happen incidentally when the learners encounter words on a repetitive basis and begin to understand the meaning with the help of the context (Krashen, 1989; Ponniah, 2011). The processing of new vocabulary when being exposed to a large amount of reading is incidental (Coady & Huckin, 1997; Gablasova, 2014). The reader would need to have a high percentage of understanding of the context and enough contextual clues at the appropriate proficiency level to be able to deduce the meaning of new words (Cervatiuc, 2018; Restrepo Ramos, 2015). Students exposed to extensive readings may acquire vocabulary incidentally, but also, when there is a more intentional focus on meaning, as with IRs, learners can obtain effective and lasting results (Hulstijn, 2003).

In this study, the use of IRs attempted to influence the content in-service teachers to provide vocabulary instruction, more exactly, the specialized language needed in their content classes. When teachers are more aware of the students' lexical needs, the students will have the language to communicate their knowledge of the subject matter (Gablasova, 2014). One way to focus on student's lexis is through readings that provide the context and the vocabulary needed.

2.2.3 Intensive Readings

Reading is not only the process of extracting and constructing meaning; reading is possibly the most effective way for language learners to acquire language in context (Elley & Mangubhai, 1983; Krashen, 2004; Macalister, 2014). Such language could help improve skills such as spelling, writing, grammar, and, definitely, vocabulary. Coady (1997) agrees with Krashen (2004) in that reading is essential for the building of vocabulary since words found in a given context can be easily understood and later acquired. Reading short texts as with IRs and reading large quantities of material as with extensive reading (ERs) are two approaches to teach reading, which although being opposite in nature still complement each other (Carrell & Carson, 1997; Rashidi & Piran, 2011; Tuğrul Mart, 2015).

ERs are characterized by their length and variety of topics appealing to the reader. ERs are intended to develop general knowledge, vocabulary, and reading speed, among other skills (Day, Bamford, Renandya, Jacobs, & yu, 1998; Iwahori, 2008). Richards and Schmidt (2013) characterized ERs as long, and interesting type of reading, selected by students, that would help them improve general understanding of the text read, and that would help them improve their structure and vocabulary knowledge. A large amount of material is needed to see significant improvement in the students' reading habits or vocabulary. Krashen (2004) notes that comprehensible input is key when acquiring a second language. However, the input provided by

ERs has not proven to be sufficient (Bryan, 2011; Loucky, 2003) and more focused instructions and IRs practices could augment the learning results (Laufer, 2012).

ERs could provide input if the student were to read at least one book per week (Nation & Wang, 1999). Due to their nature, ERs were not considered to be a suitable strategy to address the need for improving teachers' inclusion of language in their content classes. IRs are better used in task-based lessons that focus "not only on what the text means but how the meaning is produced" (Nuttall & Alderson, 1996, p. 38) and what structure or vocabulary is involved to understand the content. IRs are designed to provide attention to the accuracy of the text (Tuğrul Mart, 2015). Paran (2003) argues that IRs help students develop reading skills while going through the three phases of pre-reading, reading, and post-reading. The analysis of short specific texts could help students to comprehend and acquire vocabulary and structures especially in lower-level classes (Park, 2017). Shen (2008) claims that the Theory of Schema designed by Coady (1979) can be very well supported with IRs. The Schema Theory is a psycholinguistic model that appeals to students' background knowledge, necessary to understand general information. The Schema Theory explains how previously acquired information is used to obtain more information, allowing the background of the reader to play an important role in comprehension.

IRs focus on the nature of the language of the text, its meaning, and how it is produced (Nuttall & Alderson, 1996). Park et al. (2018) describe the use of IRs as an approach where students focus on meaning and analysis to improve linguistic knowledge, which is exactly the need in-service teachers have of improving specialized vocabulary. Thus, for this present study, the use of IRs seemed to be a more appropriate approach to aim at the need at hand to focus on the language of learning. The readings focused the content Science teachers on the necessary

vocabulary to acquire the content knowledge making them more aware of the need to focus on language.

2.3 State of the art

2.3.1 Language of Learning

The Content and Language Integrated Learning approach (CLIL) has been a topic of interest for researchers (Llinares, 2015; Luisa Pérez-Cañado, 2012; Pavón Vázquez, 2018; Roiha, 2019; Ruiz de Zarobe & Lasagabaster, 2011). European and American studies give a description of the benefits and drawbacks of this innovative approach (Luis Banegas, 2017; Nuñez Asomoza, 2015; Van Compernolle & Henery, 2015). Previous research on the implementation of CLIL showed the need teachers have for more training on balancing content and language (Aiello, Di Martino, & Di Sabato, 2017; Mariño, 2014; Perez Cañado, 2016; Rodríguez, 2012). However, studies done on the specific language needs content teachers have concerning their language of learning have been very scarce. Students' acquisition of the target language could be more difficult when teachers do not know how to include language objectives in the content classes (Baecher et al., 2014; Livers & Elmore, 2018). There have been some studies that look into the use of content language needed for content classes (Farrugia, 2013; Vaughn et al., 2009), but those studies do not specifically focus on the language of learning required by a teacher to teach the language needed in CLIL classes. Although there is a clear concern on the balanced integration of language in content classes (Cammarata & Tedick, 2012; Creese, 2010; B. A. Mohan, 1979; Short, 1993), few studies focus on teachers' language of learning in content classes. Based on this, new CLIL in-service teachers should obtain more training to improve their language of learning (See Figure 1); that is, the vocabulary or language aspects required to teach the content material to fulfill their students' needs.

2.3.2 Vocabulary Instruction

The language of learning, as stated in the theoretical framework (see section **¡Error! No se encuentra el origen de la referencia.**), is the language necessary to understand conceptions related to the content (Coyle et al., 2010). Part of this language is the specialized vocabulary pertaining to each subject. Various studies have been conducted to analyze the different ways to approach vocabulary instruction in language and content subjects (Aldridge, 2005; Alqahtani, 2015; Harmon, Hedrick, & Wood, 2005; Judd, 1978; Kinloch & Faulkner, 2010). Some vocabulary is acquired while reading (Jenkins et al., 1984), and some vocabulary could be learned in isolation before reading, both types of instruction prove to be effective when approaching communicative language teaching in content classes (File & Adams, 2010). Furthermore, various studies agree that reading could be a beneficial way to teach and acquire vocabulary (Beck, Mckeown, & Mccaslin, 1983; Chandler, 2008; Ryder & Graves, 1994; Zimmerman, 1997). Ponniah (2011) argues that subconscious learning happens when students encounter words on a repetitive basis as they read and begin to understand the meaning with the help of the context of the reading. A direct approach to vocabulary could guarantee more retention (Pérez & Alvira, 2017). One of those types of direct approaches could be the use of IRs, the characteristics of which prove to be effective for learners who need to become more aware of the form of the language (Nuttall & Alderson, 1996).

In-service content teachers could also benefit from this type of readings to become more aware of their own language competence, in this case of the vocabulary needed to teach content classes (see section **¡Error! No se encuentra el origen de la referencia.**).

2.3.3 Intensive Readings

Students' comprehension in reading and the strategies to be applied have always posed a challenge to language teachers (Carrell & Carson, 1997). Perfetti & Stafura (2014) present the role word identification plays in comprehension suggesting the importance of lexical knowledge in reading comprehension. There is ongoing research on the differences when learning vocabulary from direct focused instruction and indirect or implicit learning and the effectiveness of IRs to address the former and ERs to address the latter. (Cain & Oakhill, 2004; Park et al., 2018; Perfetti & Hart, 2005; Perfetti & Stafura, 2014). Nonetheless, students may develop skills with IRs that could be transferred when facing ERs (Carrell & Carson, 1997; Miftah, 2015; Park et al., 2018; Tuğrul Mart, 2015). Mariño (2014) concluded that the combination of IRs and ERs improved students' linguistic performance. After comparing the characteristics of both IRs and ERs, the researcher determined that IR could be more beneficial for this current study (see section **¡Error! No se encuentra el origen de la referencia.**).

IRs are texts used to apply different reading strategies, such as identifying main ideas, specific structures, and, as pertaining to this study, identifying the vocabulary necessary to effectively teach a content-based lesson (Carrell & Carson, 1997; Hortua Bravo & Manjarres, 2013; Smit, Van De Grift, De Bot, & Jansen, 2017). This vocabulary includes the content obligatory language needed for each content subject (Snow et al., 1989)

Several studies conclude that reading strategies instruction in a CLIL context could enhance the learning of specialized vocabulary in students, and also encourage more independent work and autonomy (De Graaff et al., 2007; Gablasova, 2014; Leader-Janssen & Rankin-Erickson, 2013; B. Mohan & Van Naerssen, 1997). There has also been limited study using IRs to help students build their self-efficacy belief (Evelyn & Beltrán, 2010). While studies have

focused on how IRs improve students' vocabulary, there has been no examination of how IRs as a strategy could help teachers improve their content vocabulary competence. This present study wanted to focus on how content science in-service teachers could become more aware of their language of learning, more specifically their specialized vocabulary instruction.

2.3.4 Justification of research question/objectives

Nagy (2012) points out the need content area teachers have to know and teach academic language or, specialized vocabulary, to ensure understanding of the subject and learning of the language. Correspondingly, the fostering of intentional vocabulary instruction makes reading a relevant skill in content classes(Barcroft, 2009; Jenkins et al., 1984). The CLIL approach focused on the integrations of content and language instruction. Although there has been research on the implementation of CLIL in Colombia as institutions are just beginning to address the implications of teaching and learning the language in a CLIL classroom (McDougald, 2015) very little work has been done on training CLIL teachers in the inclusion of the specialized vocabulary in their content classes. (Alcaraz-Marmol, 2018; McDougald, 2016a). Furthermore, no attempt has been made to use IRs to focus on the content vocabulary to help teachers acquire and identify the language necessary to teach their students (Carrell & Carson, 1997). Therefore, the present study sought to address this gap by examining the theoretical framework and the state of the art and analyze the influence IRs could have in the language of learning in-service science teachers.

2.4 Conclusion

Any content and language teacher faces the challenge to keep the perfect balance when integrating the discipline and the target language (Snow et al., 1989) However, the task becomes even more difficult when in-service teachers struggle with their specialized vocabulary (Coyle,

2005) needed to provide full comprehension of the subject matter being taught. Previous studies on the implementation of CLIL have examined the need teachers have of more training on balancing content and language (Perez Cañado, 2016; Rodríguez, 2012) Additionally, various studies have been conducted to analyze the different ways to approach vocabulary instruction in language and content subjects (Alqahtani, 2015; Harmon, Hedrick, & Fox, 2000). IRs have been used to help teachers apply certain reading strategies, such as identifying the vocabulary necessary to effectively teach a content-based lesson (Carrell & Carson, 1997). However, few studies have used IRs to focus on the content vocabulary to help teachers acquire and identify the language of learning necessary to teach their students.

This present study used IRs as a strategy to answer the research question (see section **¡Error! No se encuentra el origen de la referencia.**). The researcher worked with a group of content science in-service teachers in a bilingual school and collected the data needed to answer the question using five data collection instruments; worksheets, lesson plans, checklists for class observations, a questionnaire, and a researcher journal. These instruments were chosen to provide data on teachers' progress based on the various productions or activities in workshops, on how language objectives are planned and included in the classroom, and on teachers' impressions and views on the strategy.

Chapter 3: Research Design

3.1 Introduction

The previous chapter presented studies that explore teachers' challenges when trying to include language in content classes (Baecher et al., 2014; Cammarata & Tedick, 2012; Dalton-Puffer, 2010; Nikula, 2015). The CLIL-based approach is recognized as a way of addressing this struggle by defining the type of language needed to be included. Coyle (2010) presents the Language Triptych which describes the linguistic process followed in a content class (See section **¡Error! No se encuentra el origen de la referencia.**). Language of learning is the language necessary for the learners to know to understand the content (Coyle, 2005). This present study focused on the content obligatory language in-service science teachers ought to include in their lessons. Accordingly, this study examined how IRs could contribute to in-service content teachers' inclusion of the language of learning, more specifically their content vocabulary. The purpose of this chapter is to consider the participants, the methodology, and the steps taken in the progression of this study. This qualitative action research study observed how the use of IRs influenced teachers' own content vocabulary and, as a result, how these teachers would introduce more language instruction within their content classes. This study used a checklist to analyze teachers' lesson plans, descriptive class observations to analyze teachers' vocabulary use, a questionnaire to analyze teachers' attitudes toward teaching, and a researcher's journal. These instruments were piloted and adjusted before being applied.

3.2 Context

3.2.1 Type of study

Action research is a process that links reflection and action, bringing the theory into practice, and finding "ways of knowing, working with people in their everyday lives" (Reason &

Bradbury, 2008, p. 4). Thus, action research was a useful process that allowed the researcher to focus on a specific language issue with in-service science content teachers, analyzing the need for language inclusion in their lessons and for using an intervention to find alternatives that influence teachers' language of learning. This action research study used a qualitative methodology to examine the influence IRs have on the language of learning of in-service science teachers with a B1-B2 level (CEFR) L2 English (Council of Europe, 2001). The participant teachers' English level allows them to communicate at an intermediate level providing explanations using simple structures. The uneasiness when using the language could keep teachers from addressing language aspects in their content classes. Although a native-like competence is not necessary to teach a content class, teachers must have adequate knowledge of the language (Pavón Vázquez & Ellison, 2013).

Qualitative research focuses on observation in the field in which the purpose of the researcher is to learn from such observation (Willis, 2008). The qualitative methodology is used when the information needed is used to understand individuals' perspectives (Stoner, 2010). The principles of qualitative research best helped the researcher to address the problem observed within the classroom practice, such observations allowed the researcher to understand the need to later propose a strategy that would influence teachers into using the content obligatory language in science content lessons. The present study aimed to answer a question based on the participants' voices and the reflection of the researcher, following an emic perspective (Friedman, 2012) as a possibility to contribute to the literature by using a qualitative methodology (Creswell, 2012). It also examined how content teachers could improve their language of learning and how IRs could help solve this problem.

3.2.2 Participants

This action research study took place at a private school on the outskirts of Bogotá, Colombia. The school had engaged in the process of bilingualism for about three years and had slowly transitioned into becoming a Cambridge International school, using that international curriculum (CIE, 2017). A group of seven in-service content and language teachers in grades K-10 participated in this study. These teachers, whose first language was Spanish, ranged in age 25 to 34 years old, and held education degrees in science (4) and English (3), with an average of two to four years of teaching experience. Their English level varied between B1 and B2 levels according to the Common European Framework (Council of Europe, 2001). These are considered intermediate and upper-intermediate levels that allow the speakers to communicate on familiar topics providing brief explanations and using some complex language (Council of Europe, 2001). The participant teachers' English proficiency contributes significantly to the students´ exposure to language in their content classes (Pavón Vázquez & Ellison, 2013). The research participants were a sample of in-service content teachers of the school to provide a detailed and nuanced picture of their perspectives and understandings (Friedman, 2012).

Participants were able to conduct their classes in the target language. However, the needs analysis (see section **¡Error! No se encuentra el origen de la referencia.**) suggested that these teachers identified certain difficulties integrating the content with the language. At the same time, the focus group showed that the students' complained about not learning language in content classes and also the lack of language objectives and activities in the pre-implementation lesson plans.

Although the participants in this study understood the importance of teaching the target language in their content classes, they were still reluctant to undertake this task, as they did not

feel confident when addressing language topics (Hillyard, 2011). In terms of cognitive needs, the needs analysis also indicated how the participants were reflexive teachers who understood how their English level tends to improve as they teach their class in a second language. They were able to identify students' difficulties in their classroom such as lack of vocabulary, tendency to translate back to their mother tongue, and lack of reading skills.

3.2.3 Researcher's role

The researcher, in the present study, wanted to identify an unexplored issue regarding the influence of IR's in the language of learning of in-service science teachers in content classes. The role of the researcher in this study was that of a *teacher-trainer as a researcher*. The teacher-trainer role was dual; as a participant, when working with the teachers, and as a non-participant observer, when being at the site, observing teachers in their classrooms (Creswell & Poth, 2018). This double perspective allowed the researcher to work with teachers directly which places her in the position of a participant-observer (May, 1993) providing instructions, observing and monitoring teachers' performance in class, taking notes, gathering data, performing analysis, and drawing conclusions (Burns, 1999). The researcher was a facilitator promoting the improvement, of teaching practice guiding and encouraging teachers to include vocabulary instruction purposefully in content classes.

3.2.4 Ethical considerations

Following the ethical standards in research and considering the position of in-service content teachers, this study carefully designed letters of consent that would protect the participants' confidentiality. Sterling and Gass (2017) suggest the need to take special considerations with educational research that involves participants who, in spite of being part of the school, could refuse to participate. The first letter of consent (see Appendix **¡Error! No se**

encuentra el origen de la referencia.) was signed by the director of the school, allowing the researcher to select the participants of this study. The second letter of consent (see Appendix **¡Error! No se encuentra el origen de la referencia.**) was signed by the in-service content teachers who voluntarily agreed to attend the training sessions on the use of IR's in the classroom. Participants were informed of the confidentiality of their performance in the training sessions and their classrooms: the collected data was to be used only for research purposes and never used in the teachers' evaluation of the school.

3.3 Data collection instruments

The present study used five different instruments to collect data on how IRs influence/ contribute to the content vocabulary of in-service science teachers. Those instruments were worksheets, lesson plans, teacher observation checklists, a questionnaire, and a researcher's journal. The worksheets were artifacts used to find progress and points of comparison based on the various productions or activities in workshops held with the teachers. The lesson plans were used to observe the teachers' awareness include language instruction in content classes. The class observations served as a tool to analyze teachers' use of content obligatory language in class. A questionnaire was used to gather data based on teachers' impressions and views on the strategy, and a researcher's journal kept a record of teachers' reactions to training sessions. The combination of the data that each of these instruments provided, allowed the researcher to explore the effect IR's had on the teaching of the language of learning, more specifically, the integration of the specialized vocabulary in content science classes.

3.3.1 Descriptions and justifications

3.3.1.1 Artifacts based on Intensive Readings worksheets

The first selected instrument of data collection was the teachers' artifacts based on the worksheets used during the workshops provided. The purpose was to establish progress or points of comparison based on the various productions or activities in which the research participants engaged during the workshops. Artifacts based on worksheets are instruments produced in the class (Martínez, Borko, & Stecher, 2012) and were used to find progress and points of comparison based on the various productions or activities when filling out word trees, writing definitions, and thinking about possible strategies to implement in their lessons (see 0). Participants in this study were provided with readings that focused on specialized vocabulary in Science (Dale & Tanner, 2012).

3.3.1.2 Teachers' Lesson Plans

Teachers' lesson plans are road maps and, in this study, they were the initial evidence of teacher's willingness to introduce language into content lessons (Chizhik & Chizhik, 2018; Rice, 1944). Lesson plans before and after the implementation were analyzed to provide information about teachers' awareness include the specialized vocabulary in their content lessons. A study done on the implementation of CLIL features also used teachers' lesson plans as instruments that gave evidence of the possible introduction of the approach in content lessons (Mariño, 2014). Lessons plans provide different types of information, but this study only focused on the language objectives identified in the lesson plan and the activities created to introduce the language of learning and, more specifically, the introduction of the vocabulary needed for each content lesson.

3.3.1.3 Checklists for Class Observations

Checklists to record data derived from class observations were the best option for the instrument to use when the researcher wanted to see first-hand how the teaching of language was being included in the classes. Class observations were also important to see the kind of strategies teachers were to considered if they were to introduce the teaching of specialized vocabulary into their practice. (Wilkinson & Birmingham, 2003). Through class observations, the researcher took the role of a non-participant observer (Burns, 1999), wanting to objectively collect data directly without the teacher knowing he was being observed on the specific issue of using the specialized vocabulary. The observer adopted the school's observation checklist, selecting only the aspects needed to collect information. These aspects were chosen to observe the teachers' knowledge of the language, to observe how language was being included in the class, and to observe participants' language production in the class (see **¡Error! No se encuentra el origen de la referencia.**). The researcher used checklists to organize and identify objectives, activities, and strategies used by the teachers to include specialized vocabulary in their content classes.

3.3.1.4 Questionnaires

To identify in-service teacher's views and opinions about the proposed strategy, the researcher selected the use of a questionnaire as one of the instruments for this study. Questionnaires are self-reported data instruments that collect information, such as opinions based on the respondents' experiences (Griffee, 2018). Questionnaires provide information directly recorded by the respondents (Sterling & Gass, 2017) thus, the need to create clear and easy to read questions in order to interpret the data correctly. In this study, a questionnaire was applied to gather information about in-service content teachers' opinions and feelings about the strategy

(IRs) implemented to improve the inclusion of language in their content classes (See **¡Error! No se encuentra el origen de la referencia.**).

3.3.1.5 Researcher's Journal

The main purpose of journal writing is to keep a record of the researchers' thoughts, choices, values, and experiences before, during, and after the process of the research (Ortlipp, 2008). Journaling allows for active reflection leading to reviewing, analyzing, and drawing conclusions as possible questions and answers are found in relevant sources (Borg, 2001). The journal aimed to record personal perceptions about the participants and their practices emerging in the collected data. This journal enabled the researcher to compare the preliminary interpretations with the issues that appeared in the analysis phase (Lindroth, 2014). At the same time, this journal allowed the researcher to record the reactions, feelings, and behavior of the participants (Ortlipp, 2008). The journal was an important tool used to record the process in-service content teachers underwent during their workshops that is, their discoveries and reactions while participating in the workshops, and when planning and teaching their science lessons.

3.3.2 Validation and piloting

The present research study was informed by an identified need in content bilingual science in-service teachers not including the language of learning in their content classes. It also revealed student's discouragement when not perceiving language support from teachers (See section **¡Error! No se encuentra el origen de la referencia.**). A pedagogical strategy was proposed to explore how IRs contribute to in-service content teachers' use of the language of learning. In line with the proposed emic perspective, five different instruments were designed and validated to gather data. The instruments were validated before implementation in two different debriefing sessions (Davis, 1992) with a group of colleagues and a research expert. The

reviewers worked as a group examining each one of the instruments. The validation included a think-aloud session expressing understandings of questions. Revised versions of the instruments were checked to identify wordings and categories looking for internal consistency (Cohen, Manion, & Morrison, 2007), and final written feedback was provided by an experienced researcher.

Before the pedagogical implementation, the five different instruments were appropriately piloted. The lesson plan document analysis and the class observation checklists and were submitted to critical analysis through peer-reviewing with an expert and three practitioners to identify problematic terms. A second draft of the documents mentioned above was reviewed with the thesis supervisor using think-aloud techniques. Further changes and clarifications of some statements were incorporated for the final version. Since piloting the documents was necessary for the validation of the instruments, a trial session with a colleague was conducted before implementation.

In line with the nature of the qualitative research approach, the design of the worksheets started from the initial analysis of workshops. The researcher selected the topics of the worksheets based on the most common topics worked in basic science. Likewise, the type of questions to be used in the worksheets were piloted with a similar population during an initial one trial workshop and the insights helped the researcher in understanding the type of activities to include in the worksheet when devising the lesson plans.

The construction of the questionnaire began with initial statements coming from the need to ask questions that would provide teachers' views on the strategy. Then, a list of statements was refined by the researcher and it was later reviewed by four experienced language teachers. Taking into account that the different ways in which a question is formulated and framed could

radically affect the answers (Dörnyei & Taguchi, 2009), peer checking was used to revise the actual wording of statements to avoid misunderstandings or any sort of bias, and thus, enhance the chances of obtaining reliable answers from the respondents.

3.4 Conclusion

To answer this study's question (see section **¡Error! No se encuentra el origen de la referencia.**), the researcher worked with a group of 7 in-service content and language teachers in grades fifth to seventh grades. This group of teachers was characterized by having some language proficiency difficulties facing language issues in the content classes. The researcher collected data using five worksheets, lesson plans, class observation checklists, a questionnaire, and the researcher's journal as collection instruments. Lesson plans gave evidence of the process of the inclusion of language in content classes. The checklists were used to record data based on observations of language-related activities and teachers' vocabulary use. The questionnaires provided information about and also teachers' opinions about the effect of IRs on their content classes. The researcher's journal recorded the path that was followed as the study progressed.

The following chapter describes the design of the pedagogical intervention used to apply the strategy, using IR's with in-service science teachers and capture data regarding this process.

Chapter 4: Pedagogical Intervention and Implementation

4.1 Introduction

One of the characteristics of a qualitative research study is the construction of theory based on the interrelations between the data collected and the analysis of that data (Corbin & Strauss, 2015). The researcher used this research design to answer the question of how the use of intensive readings (IRs) influenced the teaching of the language of learning; more specifically, the specialized vocabulary in in-service science teachers.

For the implementation of IRs, the researcher applied five different instruments (worksheets, lesson plan checklists, class observations, a questionnaire, and the researcher's journal) to collect data on the influence of IRs in science teaching practice when including specialized vocabulary in their science lessons. The purpose of this chapter is to account for the timeline implementation and pedagogical intervention designed to collect data. The timeline details the stages, objectives, and activities included in each of the sessions with in-service science teachers. Furthermore, an explanation of the vision of language and vision of the curriculum provides the researcher's perspective on the nature of language teaching used for this particular research study.

4.2 Visions of language, learning, and curriculum

4.2.1 Vision of language

Having a clear understanding of the learners' language needs defines the strategies required to help learners receive and produce a new language (Tudor, 2001). The nature of language is considered from two perspectives in this study's context: language as a linguistic system and language from a functional standpoint. On one hand, the vision of language focused on language as a linguistic system that needs to be divided into small lexis units, such as vocabulary, that is

the specialized vocabulary to be taught in a content class. Tudor (2001) suggests that vocabulary building is the core of any language learning process, and the receptive knowledge of words is not the same as the productive knowledge of them. This study wanted to bring in-service teachers' attention to the importance of language instruction, the introduction of specialized vocabulary into their content classes, and the strategies used to productively teach it in their content classes (Xerri, 2015).

On the other hand, the language functional nature was evident when the participants used academic language to interact during their workshops. Participants engaged in professional interactions and reflections on their teaching practice while working with the IRs. Therefore, the communicative function of the language was perceived as a way to share information becoming a learning community. Language allows expression of meaning within a specific discourse in a community. Lave & Wegner (Lave, Wenger, & Alfaro, 1991) proposed that learning comes from social and interactional contexts. Learning in a community or a group happens when thoughts, actions, and teaching practices that participants produce are applied or even reshaped in collaboration with each other (Elster, 2009). The participants in this study shared ideas and strategies in the learning sessions that exposed them to specialized vocabulary. In the case of this present study, the purpose was the use of intensive readings as a strategy to influence the teaching of language in content classes.

4.2.2 Vision of learning

According to Piaget (Piaget, 1971), learning is a process that involves change. Learning is the construction of or building on prior knowledge. Constructivism is a school of thought that emphasizes the cognitive and the social aspects of knowledge (Suhendi, 2018; Vygotsky, 1978). The implementation in the present research study highlights the cognitive construction of

knowledge where learners build and discover meaning (Brown, 2007), thus, the participants, in-service science teachers, used their previous knowledge to freshen specialized vocabulary needed to effectively teach content in their lessons (Coyle et al., 2010).

This present study considered participants' expertise in the discipline being taught as well as the English level proficiency to begin the construction of new vocabulary on previously acquired knowledge. The sessions were designed to help participants scaffold their vocabulary language, and identify the specialized vocabulary used in their science classes providing opportunities to recognize, use, and describe vocabulary using their own words. The sessions provided a pedagogical space to reveal participants' knowledge and use of the language, and also a reflection on the strategies used in their science classes.

4.2.3 Vision of curriculum

In terms of content, the training sessions with bilingual in-service science teachers were not attached to a specific curriculum. However, the topics selected were related to the program they followed with their students. Teacher- training sessions consist of specific and controlled times set up aside to provide cooperative work among the participants (Casal, 2008). The sessions, in this present study, focused on the use of intensive readings which provided content obligatory language used in science classes. The readings were selected according to the participants' English level (B1-B2) and relevant topics they would teach in their classes.

This present study focused on observing the influence IRs would have on in-service science teachers' content lessons; thus the researcher included in each worksheet not only the specialized vocabulary needed for the lesson but also the sharing of strategies to teach vocabulary to their students. This type of cooperation encouraged the participants to model some of those strategies during the training sessions.

4.3 Instructional design

4.3.1 Lesson planning

Lesson planning and intervention were presented in ten sessions to assure the authenticity of the research (Cohen et al., 2007) providing sufficient time to observe a fair representation of the influence IRs had on the participants' language of learning. In each one of these training sessions, an IR was presented to the participants. The researcher selected IRs as a strategy to focus on the language of learning (Coyle et al., 2010), and more specifically the specialized vocabulary used in science lessons. By definition, intensive readings are shorter texts used to focus on the structure of the language used in the reading (Carrell & Carson, 1997), providing readers with the possibility to analyze the language and focus on the structure (See **¡Error! No se encuentra el origen de la referencia.**). For the development of each worksheet three sections were considered to help participants in the improvement of the specialized vocabulary by providing activities such as word trees which are graphical representations of the association among words. These activities allowed the participants to brainstorm vocabulary as they tried to associate it with one selected word or keywords in context (Wattenberg & Viégas, 2008). The second part of the worksheets provided an opportunity for participants to give a description of the word. There are benefits when trying to provide a definition as learners are forced to use their previous knowledge and create explanations of key vocabulary (Ellis, 1994). The last part of the worksheet asked participants to create a strategy they would use to teach the vocabulary provided to later share with the rest of the participants. This type of cooperation enriched the results of each workshop as it was made more real and practical. These worksheets were piloted and revised by other practitioners who helped refine the lessons and differentiate activities to be adapted for each session. IRs provided opportunities for the participants, not only to be exposed

to the specialized vocabulary but to recognize the difficulties their own students could encounter when learning content and language at the same time. IR's also provided examples of activities to approach new vocabulary such as mind maps, word association and word description.

4.3.2 Implementation

The implementation of this present study took place during August, September and October 2018 according to the action plan. The pre-implementation stage included the observation of teachers' lesson plans and classes before the workshop sessions. During the while-implementation stage, the sessions were planned to be carried out twice a week in teacher training meetings scheduled by the school. These sessions were usually forty-minutes long before the activities of the school day began.

Table 1

Pedagogical Implementation Stages

SESSION	STAGE	OBJECTIVE	ACTIVITIES	TIME	DATA COLLECTION INSTRUMENTS
	Pre-implementation	To consolidate participants' initial experience in terms of specialized vocabulary and use of readings in their lessons.	Analysis of inclusion of specialized vocabulary in the teaching objectives, learning outcomes, and instructional practice in order to provide an initial profile of the participants in this present study.	60 min	Lesson Plan checklist
		To consolidate participants' initial procedure in terms of language instruction in participants' classes before implementation	Analysis of inclusion of specialized vocabulary in the teacher's methodology and students' outcomes in the class to provide an initial profile of the participants in this present study.	60 min	Class Observation
1-2	Implementation Orientation-Introduction and piloting of worksheet	To define and describe nouns from the IR using their own words.	Intensive Reading 1 (IR): ***Cell Division through Mitosis*** **Warm-Up**: Creative an open crossword puzzle **Input Activity:** Identifying keywords and describing some specialized vocabulary from reading **Group Work**: Answer the questions provided in the worksheet.	80 min	Worksheets

			Closing: Sharing a teaching strategy to teach the same specialized vocabulary found in reading.		
3-4		To identify adjectives from the IR using their own words.	Intensive Reading 2 (IR): ***Magnets and Electromagnets*** **Warm-Up**: The ball of yarn vocabulary **Input Activity:** Identifying from the most difficult to the easiest vocabulary words. **Individual Work**: Answer the questions provided in the worksheet. **Closing:** Sharing a teaching strategy to teach the same specialized vocabulary found in reading.	80 min	Worksheets
5-6		To recognize correct and incorrect pronunciation.	Intensive Reading 3 (IR): ***Angiosperms*** **Warm-Up**: Pronunciation and mispronunciation game **Input Activity:** sounding out the new specialized vocabulary **Individual work**: Identify the most difficult words to understand while	80 min	Worksheets

			reading the text and answering questions on the worksheet. **Closing:** Sharing a teaching strategy to teach pronunciation of the same vocabulary found in reading.		
7-8		To observe participants ability to describe the specialized vocabulary using their own words	Intensive Reading 4 (IR): ***Organic Compounds*** **Warm-Up**: The "hot seat" game **Input Activity:** Brainstorming for known vocabulary on the topic **Individual Work**: Answer the three questions provided in the worksheet. **Closing:** Sharing a teaching strategy to teach the same vocabulary found in reading.	80 min	Worksheets
9-10		To observe participants ability to use COL when sharing an experiment	Intensive Reading 5 (IR): ***The Scientific Method*** **Warm-Up**: Picture observation **Input Activity:** Answering questions from reading and identifying key COL words	80 min	Worksheets

			Individual Work: Sharing an experiment in the session going over the steps of the scientific method. **Closing:** Sharing impressions on the experiment observed		
	While-implementing	To identify language instruction in at least four of the participants' classes while implementing	Analysis of inclusion of specialized vocabulary in the teaching objectives, learning outcomes, and instructional practice in order to identify the influence of the IRs in the participants' pedagogical practices.	120 min	Class Observation
	After-implementation	To identify language aims within participants' lesson plans after implementation	Analysis of inclusion of specialized vocabulary in the teaching objectives, learning outcomes, and instructional practice after the use of IRs.	60 min	Lesson Plan checklist
		To identify language instruction in participants' classes after implementation	Analysis of inclusion of specialized vocabulary in the teacher's methodology and students' outcomes in the class after implementation.	60 min	Class Observation
		To gather data based on teachers' impressions and views on the strategy	Analysis of participants' reactions to the IRs, and influential aspects in their teaching practice	15 min	Questionnaire

The researcher originally planned to work on one IRs worksheet per session. However, when teachers were asked to share their teaching strategies the time was not sufficient. Therefore, the researcher decided to use two sessions per IRs worksheet. During each session, participants were required to carefully read the texts by aiming to understand the meaning of the specialized vocabulary provided in the readings. Since the nature of IRs demands attention to details in the texts (Carrell & Carson, 1997), every session the participants were required to either work in a group or individually on the reading provided. At the same time, participants were asked to create and share teaching vocabulary strategies in every session. The post-implementation stage consisted of the observations of teachers' lesson plans and class visits after the sessions along with the teachers' questionnaire.

Table 1 illustrates the implementation in detail.

4.4 Conclusion

Considering the different perspectives on the nature of learning, language, teacher training, and use of curriculum helped the researcher to design and implement a pedagogical plan of action that could help provide the evidence needed for this present study. As previously described (see section **¡Error! No se encuentra el origen de la referencia.**), this small-scale action research aimed to identify the influence of intensive readings in the teaching of language in in-service science teachers' lessons.

The vision of language was focused on a linguistic system, vocabulary, and more specifically, the specialized vocabulary in-service teachers need to include in their CLIL lessons (Cammarata & Tedick, 2012). The vision of learning was based on a constructive view of learning as participants build new knowledge on previously known vocabulary. The purpose was to recall as well as to learn specialized vocabulary that would enrich their teaching of language in science classes.

This pedagogical intervention allowed in-service teachers to be exposed to IRs which contained the specialized vocabulary required to teach a science lesson in the target language. Although participants were exposed to different activities, there were three constant tasks (word trees, description of words, and creation of strategies) included in the worksheets that aimed to develop skills when facing and presenting new vocabulary.

The pre, while and post-implementation of this study provided information through the instruments previously described (see **¡Error! No se encuentra el origen de la referencia.**). The data collected provided was carefully analyzed and the results were compared before and

after the implementation. The narrative of such findings, as well as how the data was collected and documented is discussed in the next chapter.

Chapter 5: Results and Data Analysis

5.1 Introduction

The implementation of this present study was based on the vision of language directed to language as a linguistic system and more specifically focused on specialized vocabulary that exposed teachers to language for specific purposes (Tudor, 2001). The aim was to use intensive readings (IRs) as a strategy to influence the teaching of language in content classes. The vision of learning and vision of curriculum focused on teachers' previous knowledge of the specialized vocabulary found in topics related to their school programs. The implementation sessions provided a pedagogical experience to reflect on the use of their specialized vocabulary and the teaching strategies used in their science lessons.

This chapter describes the data collected during the implementation and management procedures for the qualitative data. A description of the analysis of the instruments is provided and how the processes of coding and axial coding led the researcher to identify the emerging categories that would validate the answer to the research question (Corbin & Strauss, 2015).

5.2 Data management procedures

Data was gathered through the five instruments selected (See **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.**). The data documents (the IRs worksheets, the lesson plan observations, the class observation checklists, the participants' questionnaire, and the teacher's journal data) were carefully organized and stored in an Excel spreadsheet (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Matrices allow detailed analysis following a range of conditions in which the events are organized (Corbin & Strauss, 2015). The researcher collected the information with each instrument in written and typed form. To thoroughly analyze the raw data, the spreadsheet was used to gather all the

information and was divided into different tables which contained the data provided by each instrument. The following step was to analyze each table generating codes from each datum using words and at times phrases to begin the analytical process (Saldaña, 2009). The researcher used color-coding, a process in which qualitative data can be analyzed and that involves finding similar themes or ideas (distinguished with a given color) that emerged from each one of the instruments. It allowed the researcher to analyse the identified codes in each instrument to later group them into concepts (Flick, 2009). This type of comparison of the concepts helped the researcher identify patterns that later led the emerging categories and subcategories.

This present study required the collection of qualitative data to identify the participant's planning and teaching patterns presented before, while, and after the pedagogical implementation. Likewise, the questionnaire and the researcher's journal provided qualitative data that after being analyzed, prominent themes and categories were arranged to have a better understanding of the researched issue. The researcher's journal was an instrument used to narrate and describe the participants' actions and attitudes during the workshop sessions. This narrative was also a self-reflection of the researcher's role during the sessions.

During the sessions, the participant teachers worked with worksheets that included an intensive reading and several questions that assessed the use and meaning of the specialized vocabulary provided in the readings. The answers provided by teachers in the worksheets were condensed and analyzed as *thoroughly answered*, *partially answered* or *not answered* at all. This qualitative analysis was chosen to observe the teachers' language ability to work with the intensive readings provided in the sessions. The lesson plans and the class observation checklists in the pre and post-implementation provided detailed information about the influence IR's had on the teachers' practice.

The researcher collected the information and analyze the data putting it together in a meaningful way (Elliott, 2018) and then color-coded the emerging information in a digital matrix to have a more accurate and detailed observation. While searching for recurring words or themes in the data some core consistencies were identified along with patterns found in each of the instruments, such as awareness and lack of awareness of specialized vocabulary and strategies to teach specialized vocabulary. This analysis allowed the researcher to compare and triangulate the information to later identify the three emerging categories (Burns, 2009). There were two rounds of this initial coding. First, when the researcher worked by herself and later when sharing ideas with a colleague and an expert researcher before identifying the core category which the researcher identified as the potential breakthrough of specialized vocabulary teaching (see 5.3.3).

5.2.1 Validation

The reliability of the results of this data collection was based on a process of triangulation which is the authentication of evidence using different instruments of data collection to compare information and thus, ensure validation (Ortiz & Green, 2014). The emerging codes in each instrument were compared as the researcher printed the spreadsheet document and identified categories that repetitively appeared in the different instruments. This allowed the researcher to see the codes that had emerged from each instrument facilitating the validation of the data and identifying categories. The data collected through the lesson plans and class observations checklists to observe the impact of strategy on the participants teaching practice; the teachers' intensive reading worksheets to find progress and points of comparison based on the various productions or activities in workshops; and the questionnaire and researchers' journal to gather participants perceptions throughout the implementation process were the elements used in cross-validation (Bernard, Wutich, & Ryan, 2016; Creswell, 2012; Lichtman, 2012).

The reading and analysis of the matrix and the mind-map were shared with a research expert and other peer researchers. Their feedback suggested some adjustments in the wording of the categories making emphasis on how the influence of IRs was evident in the readings used by teachers, the specialized vocabulary activities proposed after implementation and the teachers' awareness of the value of sharing strategies. These suggestions were taken into consideration to make a final decision on the coding and categories used from the emerging data. The qualitative information was successfully organized to better answer the proposed question in this research study (see **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.**).

5.2.2 Data analysis methodology

Grounded theory's main objective is to create theory from observed data (Corbin & Strauss, 2015). The grounded theory is a "systematic, qualitative procedure used to generate a theory that explains, at a broad conceptual level, a process, an action, or an interaction about a substantive topic" (Creswell, 2012, p. 423). Such a theory requires detailed and systematic data interpretation (Burns, 2009). Grounded theory allowed the researcher to handle the data and organize it to make it more manageable and comprehensible which would help the researcher build a valid theory (Given, 2014). The accurate formation of codes and categories would lead the researcher to more exact findings. This study aimed to find the influence of intensive readings in the teaching of the language of learning in content science in-service teachers. The researcher prepared each of the instruments for analysis, unitizing the data, coding the data, refining the codes, exploring for patterns, and finally interpreting the collected data (D. . Long, Strauss, & Corbin, 1993).

The analysis procedure consisted on the careful revision of the information found in each instrument application (Richie & Lewis, 2003) using a coding approach, that is identifying the codes in each instrument, grouping the concepts found throughout the instruments, and finally identifying main categories that would provide a theory or core category that could explain the conceptual density of topic of research (Creswell & Poth, 2018; Holloway & Todres, 2003).

The collection of data began before the pedagogical implementation. The participant teachers' lesson plans and class observations provided information about the teaching of language in the science content classes. While attending the implementation sessions, the researcher was able to collect information about teachers' attitudes towards the workshops and their language proficiency. Revising the worksheets, the researcher observed that most teachers were able to finish the task promptly. After the implementation, the class observations and the lesson plans provided clear information on the the influence of intensive readings. Lastly, the teachers' questionnaire collected the participant's impressions of the implementation sessions. These instruments, along with the researcher's journal, allowed the researcher to triangulate the information, integrating major categories and generating the following core category: *The potential breakthrough of specialized vocabulary teaching* (see 5.3.3).

5.3 Categories

5.3.1 Overall category mapping

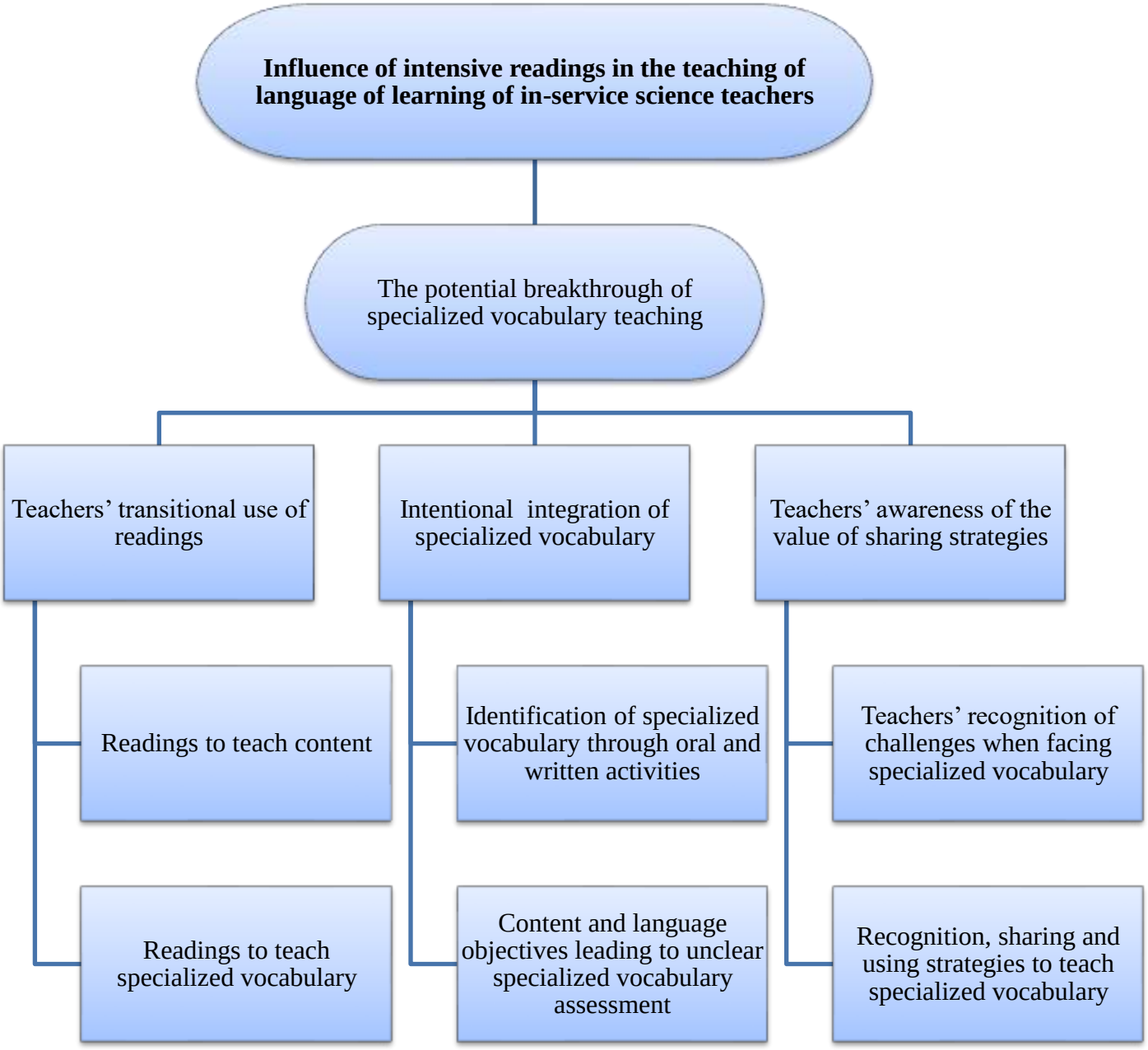
The identification of commonalities and recurrent topics when triangulating the five instruments, that is the worksheets, the lesson plans, the class observation checklists, the teachers' questionnaire, and the researcher's journal permitted the researcher to examine and identify 16 initial codes (see Table 2 below).

Table 2

Open-coding: initial codes

Research Question	Initial Coding
How do intensive readings influence the teaching of the language of learning of in-service science teachers with a B1-B2 level (CEFR) L2 English?	Inclusion of specialized vocabulary Awareness of specialized vocabulary / Glossaries Written and oral production including specialized vocabulary Clear content objectives vs Unclear language objectives No specialized vocabulary assessment Usage of specialized readings Reading comprehension aiming at specialized vocabulary Aiming at content using readings Exposure to different types of specialized readings No evidence of the use of intensive readings to teach specialized vocabulary No attention to specialized vocabulary teaching Teachers' rationale towards the use of IRs Recognition of strategies to teach specialized vocabulary Sharing useful strategies to teach specialized vocabulary Positive teachers' participation Challenges using own vocabulary to describe concepts

The researcher continued with the analysis of the data making comparisons of the codes emerging in each of the instruments and identifying relevant topics looking for broader codes that would lead to the answer to the research question. Out of the initial codes, three categories emerged; *Teachers'transitional use of readings, intentional inclusion of specialized vocabulary,* and *teachers' awareness of the value of sharing strategies* (See Figure 2). The latter category was a surprising element for the researcher when observing how teachers had a positive



inclination for the use and the sharing of strategies to introduce specialized vocabulary into their teaching practice.

Figure 2. Data analysis mapping

5.3.2 Discussion of categories

5.3.2.1 Teachers transitional use of readings

Class observations and lesson plan checklists revealed the limited use of readings to teach content and the minimal intention to use readings to teach the specialized vocabulary before implementation. Intensive readings during the implementation sessions made an influence in the inclusion of readings in the content of science classes and the use of readings to teach the specialized vocabulary.

5.3.2.1.1 Readings to teach content

The parallel made between the teachers' class observations, and the lesson plans before and after the implementation demonstrated that the use of readings in content science classes was transitional. Before the implementation, there was the prominent use of readings to merely answer content questions in provided workshops.

Excerpt 1. Lesson Plan sample T3.

# SESION	OBJETIVOS DE APRENDIZAJE	INICIO (OPENING)	DESARROLLO (LESSON DEVELOPMENT)	CIERRE (CLOSING)	RECURSOS (RESOURCES)
17-18	6PF4. Recognize friction (including air resistance) as a force which can affect the speed at which objects move and which sometimes	Where students get deep into the topic of the friction, air resistance and water resistance. **TH. What is friction,**	Students will read from page 55 to page 60 of My Par Are Here student's book 5B and resolve a proposed workshop.	Finally, they will identify where and in which situations are the friction, the air and water resistance manifested.	Video beam, whiteboard, pens and markers.

	stops things from moving.	**water and air resistance?**			

After the implementation, teachers' planning transition into lessons based using readings that addressed mainly the content. The following comments (See Table 3) taken from the lesson plan checklists demonstrate how they transition towards using more readings in class.

Table 3

Lesson Plan Checklist. Transition of the use of readings in participants' lesson plans

	T3	*T4*	*T6*	*T7*
Before Implementation	*Students are provided with a **workshop**.*	*A short reading is assigned, but **there is no mention** of specialized vocabulary.*	*There is **no inclusion** of an activity that will help assess student's understanding of the specialized vocabulary.*	***No readings** involved*
	T2	*T3*	*T4*	*T6*
After implementation	*Students are asked **to read about electricity** in the book*	*Based on **some readings from the textbook's students** needed to fill up the concept map that contained some of the specialized vocabulary needed for the class*	*Students are assigned **to read information from the book** to detect the differences between the concepts.*	*A laboratory guide is provided but **no mention is done about specialized vocabulary**.*

Teachers reported the use of different types of readings to contextualize the content being taught. The class observations gave evidence of the use of scientific readings including reading comprehension activities that would lead students to scan the texts for general information or to summarize readings identifying main and secondary ideas. The following excerpt reports

teachers' recognition of the value of making use of several types of readings and information sources.

Excerpt 2. Questionnaire. *October 2018*

> *"I use paragraphs, tales and **magazines** to teach a specific topic". T4*
>
> *"I used paragraphs taken form specialized books, **mainly college books** and **pure science books**. Besides online **encyclopedias**". T5*

In one case, a participant (T6) used scientific articles asking students to identify general information by answering reading comprehension questions, "not fostering word consciousness" (Sedita, 2005, p. 3) or providing them with the specialized vocabulary needed to understand the topic of the articles It could be argued that teachers have the intention of using sources of reading; however, there is no evidence of a careful selection of texts that students could understand (Akbari & Razavi, 2015; Nunan, 1989). The selection of authentic input of multimodal printed and online reading sources for successful processing is of utmost importance due to the fact students need the appropriate vocabulary to later use the language in class. Teachers stated that there was a variety of sources they used, however, there seems to be little attention to the gradual transition necessary to successfully expose students to these specialized reading sources or in some cases, authentic material (Berardo, 2006). This suggests the need science teachers have to scaffold activities that would allow students to face the specialized vocabulary provided in the readings.

5.3.2.1.2 Readings to teach specialized vocabulary

The use of readings to teach specialized vocabulary was somewhat evident after implementation. Three participants, T2, T3, and T4 gave evidence of using the readings to

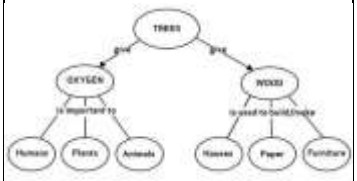
approach the specialized vocabulary needed in the class (See Excerpt 1 above). One of the participants (T3) used the student's book readings and asked her students to identify specialized vocabulary by filling up a mind map, denoting a transition from hardly using any readings before implementation, to using some readings to teach content and also specialized vocabulary. The following are excerpts taken directly from teachers' lesson plans:

Excerpt 3- Lesson plans after implementation T4. October 2018.

SESIÓN SESSION)	**OBJETIVOS DE APRENDIZAJE** (LEARNING OBJECTIVES)	**INICIO** (OPENING)	**DESARROLLO** (LESSON DEVELOPMENT)	**CIERRE** (CLOSING)	**RECURSOS** (RESOURCES)
7-8	**DBAS.3.1** Comprende la forma en que se propaga la luz a través de diferentes materiales (opacos, transparentes como el aire, translúcidos como el papel y reflectivos	*Class and throughline presentation* How can light travel? Pupils will bring a flashlight and a plastic cup. They will turn on the flashlight to observe and answer the following questions:	**Reading** Students will read page 61. They will identify the main concept of "how can light travel?" **Graphic organizer** Students will have key words on the board. They will organize the main concepts in a	**Discussion** Students will be in a round table. They will show the graphic organizers and they will evaluate their peers with the activity traffic light.	Video beam Speakers Slides containing information Student's notebooks

The findings prove that teachers had more clear intentions to use not only readings but also implement strategies that would allow students to understand the specialized vocabulary in a meaningful way (Pérez & Alvira, 2017). This suggests participant teachers were influenced by the strategies used in the implementation sessions and decided to include them in their lessons.

Excerpt 4. Lesson plans after implementation. T3. October, 2018.

11-12	**3Cp2** Explore how some materials are magnetic but may are not.	Teacher will explain how to do a concept map, she will write and example on the board and will explain the use of it. 	Then each student will create a concept map on her/his notebook taking to account the information from the reading in **Student Book 2B** pages 88 to 91.	Teacher will choose three students to share the activity and she will correct possible mistakes. At the end of the class students will develop page 93 from Book 2B. **The activity will be scored**.

At the same time, in the lesson plans, the researcher observed that other two participant teachers gave evidence of using planned strategies to teach the specialized vocabulary, but without using readings. One of them used a word search activity, and the second teacher used the creation of a glossary indicating the awareness of teaching specialized vocabulary (Chadwick, 2012). Not only teachers were using readings to teach content, but also, they began to provide the essential specialized vocabulary needed for their classes.

Excerpt 5. Lesson plans after implementation. October 2018. *"Using the word search and picture workshops"*.

3 & 14	2Eo8 Talk about predictions (orally and in a text), the outcome and why this happened	**STATIC ELECTRICITY** **SCIENCE OR MAGIC?** Students bring to the class a balloon each of them blows the balloon and rub it. Then students watch a video related to static electricity in order to know that there are different kinds of electricity.	**ELECTRICITY WORKSHOP** Students developed a workshop of electricity. They have to circle the item that use electricity.	**MY PALS ARE HERE 1B** Students work on pages 92 & 93. They look at the picture and answer the questions.	Balloon Notebook Workshop Pencil case Pieces of paper

Excerpt 6. Lesson plan while implementation. October 2018. *"Student must design a pocket book with the glossary". T7*

SESIÓN (SESSION)	**OBJETIVOS DE APRENDIZAJE** (LEARNING OBJECTIVES)	**INICIO** (OPENING)	**DESARROLLO** (LESSON DEVELOPMENT)	**CIERRE** (CLOSING)	**RECURSOS** (RESOURCES)
7-9	**9Bv2 Understand that organisms inherit characteristics from their parents through genetic material that is carried in cell nuclei.**	Throughline: Before genetics there is heredity Using a Pocket book students will produce a glossary where the basic concepts of genetics are going to be explained.	Previous Glossary must content a brief description of the concept, the concepts that must been on the glossary are: -Genetics -Traits -DNA -Gene -Dominance -Allele	Students must create a text where they include the words present on the glossary.	Board Markers iPad Notebook

Even though some teachers began using readings to teach the vocabulary needed in their classes, other participant teachers focused only on the specialized vocabulary but without using any kind of readings. This suggests a subtle transition into using readings to teach the specialized vocabulary, thus demonstrating that the exposure to IRs influenced them to include vocabulary activities, but the use of readings was not quite a favorite instrument to be used to achieve this purpose.

5.3.2.2 Intentional integration of specialized vocabulary

Data analysis showed that before implementation teachers included specialized vocabulary without a clear intention on how to address it or use it. After the implementation, there was a clearer intention to integrate specialized vocabulary in the teaching practice, only not through reading as expected. The possible reason for this behavior could be due to an initial

awareness of the need to use familiar strategies to teach the specialized vocabulary to later move into finding appropriate IRs to integrate the language in their lesson. This provided evidence of the possible process teachers go through when learning to integrate language into their content lessons.There was also evidence of no presence of language objectives in the planning and as a consequence, very unclear specialized vocabulary assessment (Echevarría & Vogt, 2013). However, teachers used different types of activities to identify the specialized vocabulary implementing oral and written activities.

5.3.2.2.1 Identification of specialized vocabulary through oral and written activities.

Teachers began to change the activities to address specialized vocabulary from only providing a list of words at the beginning of the class, to presenting activities that would focus more on the understanding and use of the specialized vocabulary. Participant teachers included oral and written activities to work on specialized vocabulary depending on the age of the students. Participant teacher T4 exposed her students to three main concepts in their science class, the meaning of these three terms, the pronunciation, and the usage was the main topic of one class. Later, the teacher developed an activity that would require students to prepare an oral presentation using the specialized vocabulary learned in class. The following excerpts are taken from teachers' lesson plans checklist after the implementation.

Excerpt 7. Lesson plan checklist. October 2018

Students are asked to orally present the mind map to the class. T3 *Students needed to prepare an oral presentation explaining the 3 key concepts of the class. T4*

Findings revealed that teachers also included written activities that required the use of specialized vocabulary. However, some of those activities did not have any previous preparation,

or a clear attempt to point out the key specialized vocabulary. There were language activities and oral use of specialized vocabulary identified in the class observation.

Excerpt 8. Lesson plan checklist. October 2018

Students are given a worksheet that allows them to match the sound they hear with the animal they see in the sheet. T1 *Students are asked to answer some questions about electricity and necessarily need to use specialized vocabulary. T2*

Excerpt 9. Lesson plan checklist. October 2018

Students needed to prepare an oral presentation explaining the 3 key concepts of the class T4 *Written report is expected but, no mention is done towards vocabulary. T6* *Students are also expected to write a lab report however no emphasis on specialized vocabulary. T7*

Data revealed an intention to include specialized vocabulary. The teaching of content is still much more relevant to teachers than the language needed in the required output products of the class (Baecher et al., 2014; Cammarata & Tedick, 2012). However, there was some progression done by participants T4 and T6 that when providing written and oral activities the use of specialized vocabulary attempted to be included. T4 asked students to prepare short oral presentations explaining the key concepts of *transparent, translucent and opaque*. T5 asked students to write a lab report in which learners needed to use the specialized vocabulary; however, there was no indication of any particular assessment on the use of the vocabulary.

5.3.2.2.2 Content and language objectives leading to unclear specialized vocabulary assessment

The analysis showed that teachers had very clear objectives to teach the content lessons; however, there was no evidence of language objective planning. The researcher suggests that setting specific language goals would help content teachers be more aware of the language needed in a specific lesson without necessarily adopting a soft CLIL approach or language-led CLIL (Coyle et al., 2010). Two of the participant teachers included activities to teach specialized vocabulary. In one case, the activity was previously detailed in the lesson plan but, in the other case, the activities were not planned (Baecher et al., 2014). Planning is the road map a teacher needs to ensure their activities are efficient. However, the researcher observed some lack of consistency between the lessons planned and the activities in the classroom suggesting impromptu inclusion of vocabulary activities.

Excerpt 10. Researchers' journal on the re-implementation lesson plan. September, 2018.

Activities are focused on the content of the class. Students are expected to know how to work with specialized vocabulary. There is no input given before students begin working with the chart. They are also expected to orally report but no clear input activity is given. T5

Excerpt 11. Researcher's journal. September 2018

T5. *The planning does not have specific strategies to work with specialized vocabulary. However, students are asked to read and find information to fill out a workshop, which contains some vocabulary items, but no major emphasis is made in specialized vocabulary.* T7. *There are no specific language objectives. However, there is some evidence of emphasis on vocabulary at the beginning of the explanation of main theme of the class to ensure sts had the needed specialized vocabulary.*

After the implementation, there seemed to be more aware of the introduction of specialized vocabulary in the lessons, however, there was very little evidence of language formative assessment, the emphasis remained in the assessment of the content taught. The formative assessment could be used to identify students' progress to later provide for language needs and improve students' achievements (Dodge & Dodge, 2008). The data suggest that the lack of planned activities to integrate the academic and communicative aspects of the class led to a lack of language assessment (Snow et al., 1989; Valeo, 2010). There was only a one case scenario with participant T4 who created an oral activity that included the correct use of specialized vocabulary and included a co-evaluation activity. The following is a description of an observed class.

Excerpt 12. Class observation- T4 September 2018

Title of the lesson: How does light travel?
Students had previously studied the concepts of transparent, translucent, and opaque. In order to reinforce the concepts students needed to prepare a short presentation providing everyday examples of each one the concepts mentioned above.
Students had time to prepare presentation.
Students from other classes are invited to hear the presentations and evaluate their peers.

The findings proved the absence of language objectives in the long-term and short-term planning, which could be the reason for the absence of intentional formative assessment of the specialized vocabulary, as formerly reported in earlier publications (Creese, 2010; Snow et al., 1989). This finding suggested that content teachers' awareness of language should begin in the early stages of planning to intentionally include it in the everyday class activities.

5.3.2.3 Teachers awareness of the value of sharing strategies

As teachers experienced the sessions with the IRs workshops, their responses gave evidence of influence on their teaching practice. Teachers mentioned that the work done in the

workshops gave them a new way of looking at lessons. They found it challenging to create activities that would be effective to teach vocabulary, but appreciated the time they had to be able to improve and reinforce the teaching process. Participants enjoyed the challenging activities, the sharing of ideas and perspectives, and the strategies they were able to share to use in the classes. At the same time, teachers valued the sessions of the implementation as they were able to face some of the challenges with the IRs. Despite teachers' English proficiency (B2-C1), they still give evidence of some difficulties when asked to identify the main purpose in the readings and, also when they had to describe a specialized concept using their own English.

5.3.2.3.1 Teachers recognition of challenges when facing specialized vocabulary

During the implementation sessions, participant teachers were met with a series of intensive readings and were asked to answer 4-5 questions addressing the specialized vocabulary provided in the readings. One of the questions in the worksheets asked teachers to describe the concepts provided in the worksheets. Although writing the concept in the worksheet came easier to teachers, when asked to do it orally, in the implementation sessions, some of them struggled to remember the words or were hesitant about the pronunciation of the word (Butler, 2004). Thus, it was found that the language level of the participants varied and that their written skills were stronger than their oral communication. For some teachers, it was difficult to describe the meaning of the words, which denoted the need of teachers to conceptualize their disciplinary language "necessary for integrating content and language-oriented pedagogies" (Swart, De Graaff, Onstenk, & Knèzic, 2018, p. 414). Such conceptualization could allow teachers to more effectively model the specialized vocabulary for their students.

Excerpt 13. Questionnaire. November 2018

The most difficult part was when I had to give the definition of a word which I didn't know anything and as well because was technical vocabulary. T3

Excerpt 14. Researcher's journal. Session 7. October 2018

For some teachers, it was difficult to describe the meaning of the words. The activity did not seem to be appealing to teachers and was time consuming. *The next activity was to work on the four questions provided in the IR, some seem to struggle finding words and meaning, but at the end everybody finished the activity.*

5.3.2.3.2 Recognition, sharing, and use of strategies to teach specialized vocabulary

From the answers provided by the questionnaire after the implementation sessions, the participants recognized the value of the strategies used in the session to teach specialized vocabulary using intensive readings. Teachers mentioned that IRs gave them a new way of looking at lessons. They also mentioned that creating activities that would be effective to teach vocabulary was challenging.

Excerpt 15. Questionnaire. November 2018

The most challenging was to build teaching methods to explain the specialized vocabulary. T6 *I think that pronunciation of the specific vocabulary was the most challenging issue of the workshops. T7* *To match the new concepts with the appropriate phenomenon. To mentally representing the phenomena. T5*

Teachers also appreciated the time they had to be able to improve those strategies and reinforce the teaching process. They enjoyed the sharing of ideas and perspectives and the tools they were able to obtain to apply in the classes. Only one of them makes the connection between specialized vocabulary and the CLIL approach.

Excerpt 16. Questionnaire. November 2018

It was great because I learnt a new way to teach specific vocab in a creative way. T3 *The experience was interesting. I could have the opportunity to share my ideas and learning from different people. T4* *It was really interesting and innovating to focus on science teaching from the vocabulary and especially such complex and advanced vocabulary. It helped me consider a new point of view to my lessons. T5* *In general terms IRs activities allow to reinforce teaching processes. T7*

Excerpt 17. Questionnaire. November 2018

CLIL approach readings are useful to remind and to practice so it would be a nice way to make feedbacks. T7

Participant teachers rated very low their language teaching in content classes. Only one teacher scored high, which evidenced that the intention to teach specialized vocabulary was not a priority for science teachers. Also, when participant teachers were directly asked if the IRs workshops influenced their teaching practice, they stated that IRs influenced them because of the different teaching strategies they were able to identify and implement in class (Elster, 2009). All in all, teachers were inspired to include shared strategies that would help them improve the

inclusion of language in their classes. A few teachers mentioned the importance to guarantee students knew the key concepts and how to summarize by using keywords provided in the readings.

Excerpt 18. Questionnaire. November 2018

They have given me some ideas in order to apply in class with the pupils such as mind maps which are helpful to teach vocabulary and understand a reading. T2

With the workshops I learnt the importance of relating vocabulary with content and real-life situations for the learning process. T6

Readings and their activities remark the importance of key words and to synthesize. T7

In-service teachers made emphasis on the strategies they included and would like to include in their lesson plans when teaching specialized vocabulary. This proves that the support provided by a learning community can give birth to new ideas to implement strategies to improve participants' teaching practice (Lave et al., 1991). The following excerpts detail some of the strategies teachers shared and later used in their classes.

Excerpt 19. Questionnaire. November 2018

I like to have music or videos in which they can pair with the specialized words. T1

I would like to include the mind maps because for children are very nice and they could it on their own. T2

Graphic organizers and the meaning of different words. T4

Highlighting key concepts, designing vocabulary focused activities. Developing active strategies for teaching. T5

I have included some of the methods of the workshops, for example mind maps, infographics and construction of definitions. T6

Except 20. Lesson plans evidencing the inclusion of vocabulary instruction T2. October 2108

5 & 16	2Eo8 Talk about predictions (orally and in a text), the outcome and why this happened. 2Eo9 Review and explain what happened	**ELECTRICITY WORDSEARCH** Students work on an electricity word search in order to reinforce the vocabulary and identify the main concepts of electricity.	**MY SCRAPBOOK** Students bring pictures of three things that use electricity. Write about what these things do. Example: This is toaster, it can toast bread. Students can do the activity in their notebook or in a piece of cardboard. At the end students have to present their scrapbook in front of the class.	**MY PALS ARE HERE 1B** Students read pages 94 & 95. Then they write down a short resume of what they have read and draw some pictures related to the topic.	Notebook Workshop Book Pencil case Ipad

The lesson plans and the class observations provided some evidence of the inclusion of specialized vocabulary in bilingual science lessons. Participant teachers acknowledged the need to include strategies that would introduce the specialized vocabulary needed in class. The answers in the questionnaire suggest that the use of IRs in the implementation sessions made enough influence in the participant teachers that could lead them to potentially look for ways to include language teaching in their practice.

5.3.3 Core category

Based on the data collected and the analysis done to each one of the instruments used in the implementation, the researcher came upon linkages and commonalities in the initial codes to arrive at the three categories; teachers' transitional use of readings, intentional inclusion of specialized vocabulary and teachers' awareness of the value of sharing strategies. These three categories provided the reasons to obtain the core category: *The potential breakthrough of specialized vocabulary teaching*. Teachers provided readings to their students to identify content information, but there was no intention to focused on specialized vocabulary. However, after the implementation, there was some evidence of teachers using readings to identify the specialized vocabulary and even design mind maps utilizing such vocabulary. Teachers gave more evidence of the inclusion of vocabulary activities concentrating on the oral or written use of specialized vocabulary. However, there was no evidence of language objectives or assessment activities to complement the activities introduced in class. Teachers' awareness of the need to teach specialized vocabulary was evident when the sharing of strategies during the implementation influenced their teaching practice, and when the specialized vocabulary in the IRs sessions became a challenge for them. Hence, when in-service science teachers become aware of the importance to teach specialized vocabulary once being exposed to the use of IRs, the potential to intentionally include strategies to teach the language increased significantly.

5.4 Conclusion

The procedures followed to analyze the data coming from the implementation of the IRs sessions of this present study (open, and axial coding) helped unveiled the information needed to support that there was a potential breakthrough of specialized vocabulary teaching in Science classes. IRs influenced the teaching of the language of learning, more specifically the specialized

vocabulary needed in content science lessons. Results demonstrated that science content teachers' transition into using readings to teach the content and sometimes the specialized vocabulary needed in class. Also, there was an intentional integration of specialized vocabulary in class, even though, such insertion was not always done through readings or even IRs. Lastly, teachers became aware of the need to teach specialized vocabulary using different types of strategies learnt and discovered in the implementation sessions.

The following chapter will provide more details on the conclusions of the storyline, the impact, limitations, and pedagogical implications of this present study.

Chapter 6: Conclusions and Pedagogical Implications

6.1 Introduction

This study analyzed the influence of intensive readings in the teaching of the language of learning of in-service science teachers. The integration of language teaching in content classes was an important issue to address because the language allows the students to see, interpret, and share an understanding of the content taught (Moate, 2011). Moreover, content teachers need to guarantee students have the specialized vocabulary necessary to avoid "poor language development that will block content learning" (Banegas, 2011, p. 112). A ten-session pedagogical intervention, as well as five different data instruments, were designed to observe how the proposed strategy (IRs) would influence the teaching of specialized vocabulary in science content classes. The data collected displayed three emerging categories; teachers' transitional use of readings, intentional integration of specialized vocabulary, and teachers' awareness of the value of sharing strategies. The analysis done revealed that IRs influenced the teaching of specialized vocabulary, raising awareness in teachers' planning of strategies to work with the vocabulary needed for the class.

This chapter describes how some similar studies support the need to include the specialized vocabulary needed in content classes (Tragant, Marsol, Serrano, & Llanes, 2015), and how science teachers were able to provide more exposure to the technical, or specialized vocabulary. At the same time, other studies using readings as a strategy to teach in CLIL classes revealed some influence in the teaching of content (Ruiz De Zarobe & Zenotz, 2015, 2017). Another study found that participant teachers encouraged students to ask for new vocabulary and clarify meaning proving relevant strategies resulting in effective language and content teaching. (De Graaff et al., 2007). The participant teachers in this present study were more intentional to

include strategies that help them become more effective when teaching the specialized vocabulary. The findings in this study support the notion that the use of intensive readings (IRs) in this study, proved to have an influence on the teaching of the language of learning by in-service science teachers.

This chapter also describes the limitations encountered regarding the time needed to set up the teachers' sessions and the frequent interruptions due to the school activities that could have hindered the effect of the continuity of the implementation sessions. Thus, the researcher proposes further study done on the influence of IRs in students' language and content progress, and the effects of the inclusion of language objectives and vocabulary strategies.

6.2 Comparison of results with previous studies' results

There is a significant number of studies done in relation to the teaching of content classes that target a second language (Cammarata & Tedick, 2012; Creese, 2010; Fernández-Sanjurjo, Fernández-Costales, Miguel, & Blanco, 2017). At the same time, it is possible to find plenty of literature on the teaching of vocabulary and reading (Beck et al., 1983; Chandler, 2008; File & Adams, 2010). However, the combination of these three constructs—the language of learning, specialized vocabulary in content classes, and the influence of intensive readings in a group of in-service science content teachers— had never been particularly explored. The results of this present study revealed that the use of intensive readings influenced participants teaching of the language of learning, more specifically the specialized vocabulary needed to assure the understanding of the content in their classes.

Teachers found that there was a transition from using readings only to teach the content to use readings to also introduce the specialized vocabulary which Coyle (2010) called the provision of the content obligatory language. This finding validates the results of related studies

such as Rodriguez Bonces (2012) that identified the need to integrate the "adequate materials in the target language" which in the case of this present study is related to the selection of adequate readings that could support the teaching of specialized vocabulary. Other studies also identified the need to maintain a reasonable balance in the teaching of language and content in CLIL lessons (Cammarata & Tedick, 2012). Teachers, in this present study, became more aware of the need to include the language of learning in the readings along with the main content they wanted to teach.

Likewise, teachers' planning provided evidence of their intentional inclusion of specialized vocabulary through oral and written activities. This finding relates to previous studies (Duin & Graves, 1987; Zimmerman, 1997) where they demonstrated that the teaching of vocabulary before a writing assignment in which the words might be used, improved the overall quality of the students' production. In this study, the participant teachers provided oral and written activities that allowed students to be exposed to specialized vocabulary. Furthermore, the behavior shift of the participant teachers to intentionally include the teaching of specialized vocabulary into their teaching practice relates to De Graaff et.al's (De Graaff et al., 2007) findings. In their study with CLIL teachers, it was found that their CLIL teachers also encouraged their students to identify the vocabulary needed for their oral performances.

At the same time, the participant teachers in this study became aware of the value of sharing teaching strategies during the implementation sessions. The time shared among the participant teachers supports the results of other studies where the communities of learning (Lave et al., 1991) play a significant role in the acquisition of new and innovative teaching ideas. Elster, D (2009) studied the collaborative work done in learning communities among science education researchers and teachers concluding that "the main motive for teacher collaboration

…was the wish for qualitative change in classroom practices" (Elster, 2009, p. 69). This finding matched the ones revealed in this study, as there was a noticeable teachers' appreciation for the implementation sessions, where participant teachers were able to share ideas and strategies on how to teach the specialized vocabulary needed in their content classes.

6.3 Significance of the results

This study provided evidence of the need in-service content teachers have of providing strategies to include the language of learning, in this case, the specialized vocabulary needed in a content class. The researcher wanted to bring afore the need content teachers have to become more aware of language instruction. Therefore, by providing the proposed strategy, it was possible to observe the influence IRs had on teachers' practice, and mostly, how it helped raise awareness on finding strategies to assure the inclusion of specialized vocabulary into their planning and class activities.

The researcher identified three main findings that could contribute to the content and language integrated learning (CLIL) teaching approach to foster the inclusion of specialized vocabulary in content classes. First, results demonstrated that science content teachers' transition into using readings to teach the content and sometimes the specialized vocabulary needed in class, suggesting that content teachers take time to assimilate the need to create activities that would include the language of learning needed in content classes. Secondly, there was an intentional inclusion of specialized vocabulary in class, even though such inclusion was not always done through readings or even the proposed IRs. Although, teachers benefited from the IRs worksheets (identifying, describing and using the specialized vocabulary), only a few of them considered using the IRs when including vocabulary into their lesson plans. Few teachers attempted to use them along with the use of graphic organizers to focus on the main vocabulary

of the reading. However, most of the participant teachers decided to plan oral and written activities that would help them include the teaching of specialized vocabulary more intentionally. Thirdly, teachers became aware of the need to teach specialized vocabulary using different types of strategies learnt and discovered in the implementation sessions. The teacher interaction provided in the implementation sessions provided an opportunity to gather with colleagues to learn and share strategies being this an unpredicted result of this implementation.

The implications mentioned pointed to the need most in-service content teachers have to know how to appropriately integrate the teaching of content and language. IRs could be one of the strategies used to provide students with the language of learning needed in content classes and as Lasagabaster and Doiz (2015) conclude in their study to provide more explicit and language-focused instruction. At the same time, it is important to foster learning communities among teachers to be able to share experiences and ideas (Lave et al., 1991). Such sharing, even though it is not closely related to this study, can help teachers use and improve their English proficiency as they interchange ideas.

In Colombia, the Content and language integrated learning (CLIL) approach has been an important goal many bilingual schools would like to achieve. However, very few schools have begun a process to provide teachers with the support and training needed to assure more language learning in content classes. Likewise, very few content teachers have considered the use of readings as a strategy to teach the specialized language required in their classes. Thus, the findings in this study fill a gap related to the teaching of the language of learning (specialized vocabulary) and the different strategies that in-service teachers ought to include in their teaching practice.

6.4 Pedagogical challenges and recommendations

The purpose of this study was to observe the influence intensive readings (IRs) had in the teaching of the language of learning, more specifically, the specialized vocabulary used by in-service science teachers. There were three main challenges concerning the pedagogical use of intensive readings during the implementation sessions. First, the readings and the specialized vocabulary included in the worksheets were more challenging for some teachers than others. Some of the participants were qualified English teachers teaching science and others were qualified science teachers teaching bilingual classes. Consequently, it was necessary to take two sessions per workshop to be able to finish the exercises proposed in the worksheets. Participant teachers also helped each other to answer the questions in the worksheets provided.

Secondly, some teachers were more creative and had a better disposition when sharing strategies than others. Some participants had more years of experience and sharing strategies was easier for them. Most of the teachers brought materials to the session to sample the strategy while others did not seem very prepared or motivated.

Thirdly, teachers seemed to have some difficulties focusing on the intensive readings and finishing their tasks on time. Even though it was not required, participant teachers opted to finish the assigned task at home and promised to be ready for the next session. Most of the teachers were able to fulfill the tasks. For future research studies performed with teachers, it is recommended to work in longer sessions and thus provide the required time needed for each teacher.

Therefore, the aforementioned challenges highlight the need to set up specific training times for content teachers that would address their specific needs. Colombian schools that seek to become more bilingual must be aware of their teachers' needs and address them. Content

teachers face different types of challenges such as language teachers feeling inadequately trained to teach a subject area, or content specialists who might not recognize their important role as language teachers. It is important to include training times (Hillyard, 2011). Likewise, future implementations could focus on content specialists as they tend to have more difficulties introducing language teaching into their lessons.

6.5 Research limitations on the present study

This research study presented two main constraints during the implementation sessions. The first one was related to the times when the sessions were scheduled. The researcher had a set time to set up in the morning before the students arrived. This time was sometimes affected by late arrivals to school due to traffic issues. The sessions, then, had to be rescheduled, and this resulted in some resistance from the directors of the school. However, it was possible to agree to make up for the missing sessions.

Another significant constraint involved the attitudes of some of the participant teachers to attend some of the sessions. Specifically, two of the teachers were very busy and sometimes decided not to attend the sessions. It is important to clarify that attendance at the implementation sessions was always on a volunteer basis. However, the general attitude of the teachers was very pleasant and with a wiliness to participate and adjust schedules when necessary.

6.6 Further research

To have a more comprehensive view of how intensive reading (IRs) or any other strategy influences the teaching of specialized vocabulary in in-service content teachers, the researcher suggests a longer pedagogical implementation. This could allow the researcher to observe the progressive inclusion of strategies in the teachers' planning, and validate the execution of the

planning with the class observations. Likewise, the teachers' feedback on the inclusion of strategies to teach specialized vocabulary could also be another subject of research.

It is also recommended to analyze students' perceptions of the use of intensive readings in the class, the frequency of use in the classroom and any other strategy that could supplement the use of the readings. This study could also focus on a different aspect of languages, such as the functional language needed for writing lab reports in science classes or the oral language needed to hold debates in social studies classes.

In order to have a more comprehensive view of the integration of language instruction in content lessons, the researcher proposes a study that would include content teachers from different disciplines, such as math, arts, or social studies. This study would need more devoted time to the training of teachers, class observations and constructive feedback.

Even though the results of this present study demonstrated the use of intensive readings influenced the teaching of the language of learning, further research is necessary to examine whether the learning communities, the sharing of strategies, and the continuous teacher development could be even more influential in the CLIL teachers' practice.

6.7 Conclusion

The inclusion of language teaching in a content class, the efficient teaching strategies, and the preparation content teachers have to introduce the language into their lessons are a few of the common issues in-service content teachers face in most of the bilingual schools in Colombia. This present research study aimed to address one specific issue in a bilingual school in the outskirts of Bogota, Colombia, that is the lack of specialized vocabulary instruction in content classes. Consequently, the objective of this study was to analyze what happens to the language of

learning in content classes when Science teachers are exposed to Intensive Readings (IRs), that is what happened to the teaching of specialized vocabulary in Science content classes.

The in-service science teachers participated in ten workshop sessions that exposed them to the use of readings that would focus on the specialized vocabulary of a proposed topic. The worksheets provided activities such as word trees which are graphical representations of the association among words allowing the participants to brainstorm vocabulary as they tried to associate it with one selected word or keywords in context. At the same time, the worksheets provided an opportunity for participants to describe the word. The last part of the worksheets asked participants to create a teaching strategy they would use to present the vocabulary and later share with the rest of the participants. IRs provided opportunities for the participants to be exposed to specialized vocabulary.

The results gave evidence of the participant teachers' transition into using readings to teach the content and the specialized vocabulary needed in class. Also, there was evidence of the intentional inclusion of specialized vocabulary through readings and even oral and written activities. Lastly, teachers became aware of the need to share strategies to later include in their lessons, not to mention their increased lexicon and use of academic language, especially with the qualified English teachers teaching Science (see Participants 3.2.2).

All in all, based on the aforementioned discoveries, the use of IRs as a strategy to influence the teaching of the language of learning in content classes proved to be an effective strategy to help teachers address language issues in their content classes.

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Appendix A

Letters of Consent

Institutional Consent Letter

Apreciado Sr. [name omitted to preserve anonymity]:

Como es de su conocimiento, estoy llevando a cabo el programa de maestría "Didáctica del Inglés con Énfasis en Ambientes de Aprendizaje Autónomo", en la Universidad de La Sabana. El objetivo principal de este programa es la implementación de un proyecto de investigación que tenga como finalidad mejorar los procesos de enseñanza-aprendizaje del inglés como lengua extranjera.

Por lo anterior, solicito su consentimiento y autorización para iniciar la implementación del proyecto "Intensive Readings: A Tool to Insert Language in Content Classes". El propósito de mi investigación es determinar los efectos del uso de lecturas intensivas en las clases de Matemáticas y Ciencias Sociales como una estrategia para ayudar a los profesores de contenido a mejorar sus prácticas pedagógicas al integrar el lenguaje, más específicamente vocabulario, a la vez que se enseña el contenido. Esto con el fin de fortalecer el proceso CLIL (*Content and Language Integrated Learning*) con los profesores bilingües del colegio.

Durante su implementación los profesores recibirán material de lectura que les ayudará a identificar el vocabulario y lenguaje necesario para enseñar sus clases de contenido. Los profesores deberán incluir estas lecturas en sus planeaciones de ciclo. Se harán observaciones de clase para recolectar información de cómo se enseñan los objetivos del lenguaje al tiempo que se enseña matemáticas y sociales.

Se aclara, que la ejecución de este proyecto no afectará la planeación o actividades del plan de estudios, como tampoco tendrá incidencia alguna en el proceso de evaluación de la

asignatura. Además, a los profesores participantes se les garantiza estricta confidencialidad con la información que se obtenga y completa anonimidad.

Atentamente,

(XXXX)

Participants Consent Letter

Apreciado Sr. [name omitted to preserve anonimity]:

Como es de su conocimiento, estoy llevando a cabo el programa de maestría “Didáctica del Inglés con Énfasis en Ambientes de Aprendizaje Autónomo”, en la Universidad de La Sabana. El objetivo principal de este programa es la implementación de un proyecto de investigación que tenga como finalidad mejorar los procesos de enseñanza-aprendizaje del inglés como lengua extranjera.

Por lo anterior, solicito su consentimiento y autorización para iniciar la implementación del proyecto “Intensive Readings: A Tool to Insert Language in Content Classes”. El propósito de mi investigación es determinar los efectos del uso de lecturas intensivas en las clases de Matemáticas y Ciencias Sociales como una estrategia para ayudar a los profesores de contenido a mejorar sus prácticas pedagógicas al integrar el lenguaje, más específicamente vocabulario, a la vez que se enseña el contenido. Esto con el fin de fortalecer el proceso CLIL (Content and Language Integrated Learning) con los profesores bilingües del colegio.

Durante su implementación los profesores de matemáticas y sociales recibirán material de lectura que les ayudará a identificar el vocabulario y lenguaje necesario para enseñar sus clases de contenido. Cada profesor deberá incluir estas lecturas en sus planeaciones de ciclo. Se harán observaciones de clase para recolectar información de cómo se enseñan los objetivos del lenguaje al tiempo que se enseña matemáticas y sociales.

Se aclara, que la ejecución de este proyecto no afectará la planeación o actividades del plan de estudios, como tampoco tendrá incidencia alguna en el proceso de evaluación de la asignatura. Además, a los profesores participantes se les garantiza estricta confidencialidad con la información que se obtenga y completa anonimidad.

Atentamente,

(XXXXX)

Appendix B

Needs Analysis Instruments

Instrument 1 Focus Group

1. What is your experience of learning Science in English?

2. How does the teacher begin Science/Social Studies class?

3. Do you feel you are learning vocabulary?

4. What subject was used reading or writing in class?

5. Does the teacher give you grammar feedback when you do some writing?

Instrument 2 – Percepción Docentes Bilingues

Gracias por su participación en esta encuesta. Por favor responda las siguientes preguntas que nos ayudarán a entender mejor su percepción de la enseñanza de su asignatura en inglés.

Este cuestionario le tomará solo 15 minutos. Por favor conteste honestamente. No hay respuestas correctas o incorrectas y su resultado es completamente anónimo. Muchas gracias.

1. **De acuerdo con el Marco Común Europeo su nivel de inglés es:**

Su nivel de inglés se encuentra certificado por algún examen internacional, seleccione de la lista *

- TOEFL
- IELTS
- TOEIC
- ITEP
- No se encuentra certificado
- Otro:

2. **Considera que su nivel de inglés**
   - Le facilita el proceso de enseñanza debido a que este es suficiente para su práctica
   - Ha mejorado en el desarrollo de su labor por el aprendizaje de nuevo vocabulario y práctica constante
   - Le permite comunicarse claramente con sus estudiantes y explicar de diversas maneras u mismo contenido
   - Se ha visto afectado al dialogar con sus estudiantes debido a los errores que ellos cometen
   - Ocasionalmente no es suficiente y se ve obligado a hacer uso del español
   - Otro:
3. **De acuerdo con su experiencia docente, el uso del inglés en el aula de clase**
   - Favorece la dinámica del aula y la fluidez de la clase
   - Aporta porque facilita el aprendizaje de conocimiento global a los estudiantes
   - Hace compleja la dinámica escolar y adiciona trabajo al aprendizaje

- Dificulta el proceso de aprendizaje de los estudiantes
- Otro:

4. Seleccione de la lista los ejercicios de escritura que ha desarrollado en el año

- Crear un cuento
- Un texto reflexivo tipo ensayo
- Cartas
- Ninguna
- Reportes de laboratorio
- Reseñas históricas
- Otro:

5. ¿Cuáles son las mayores falencias que ha detectado en sus estudiantes?

Marque las lecturas que ha usado a lo largo del año en el aula de clase

- Cuentos
- Periódicos/ Noticias
- Novelas literarias/Libros
- Revistas
- Ninguna
- Otro:

¿Con que propósito usa usted las lecturas dentro del aula?

Marque los recursos de audio que ha usado a lo largo del año en el aula de clase *

- Videos
- Canciones
- Discursos

- Documentales
- Películas
- Grabaciones o pistas de audio académicas

6. **¿Con que propósito usa en clase los recursos de audio o vídeo?**
    - Considera usted que el nivel de inglés de la mayoría de sus estudiantes *
    - Permite un desarrollo adecuado de las clases y les facilita el aprendizaje
    - Interfiere en la comprensión del contenido de la clase
    - Mejora a la par con el aprendizaje de los contenidos
    - Es Insuficiente y crea la necesidad de preparación adicional
7. **Describa brevemente que tipo de capacitación que requeriría usted para lograr mayor satisfacción con su labor:**
8. **En una escala de 1(nada) a 5 (mucha), ¿qué tanta instrucción del idioma inglés está incluida en los programas que maneja**? **¿Por qué lo considera así?**
9. **Nombre uno o dos cambios que introduciría en la malla para promover la enseñanza del inglés.**

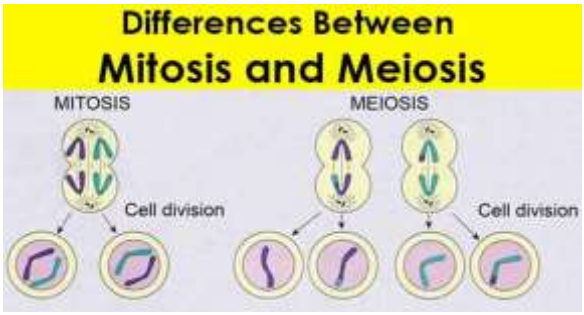
Appendix C

Worksheet Sample

Cell Division through Mitosis IR #1

Mitosis is the process by which a cell duplicates the chromosomes in its cell nucleus, in order to generate two, identical, daughter nuclei. It is generally followed immediately by cytokinesis, which divides the nuclei, cytoplasm, organelles and cell membrane into two daughter cells containing roughly equal shares of these cellular components. Mitosis and cytokinesis together define the mitotic (M) phase of the cell cycle, the division of the mother cell into two daughter cells, each with the genetic equivalent of the parent cell.

The process of mitosis is complex and highly regulated. The sequence of events is divided into phases, corresponding to the completion of one set of activities and the start of the next. These stages, in order from first to last, are prophase, prometaphase, metaphase, anaphase, and telophase. During the process of mitosis, the pairs of chromosomes condense and attach to fibers that pull the sister chromatids to opposite sides of the cell. The cell then divides in cytokinesis, to produce two identical daughter cells.



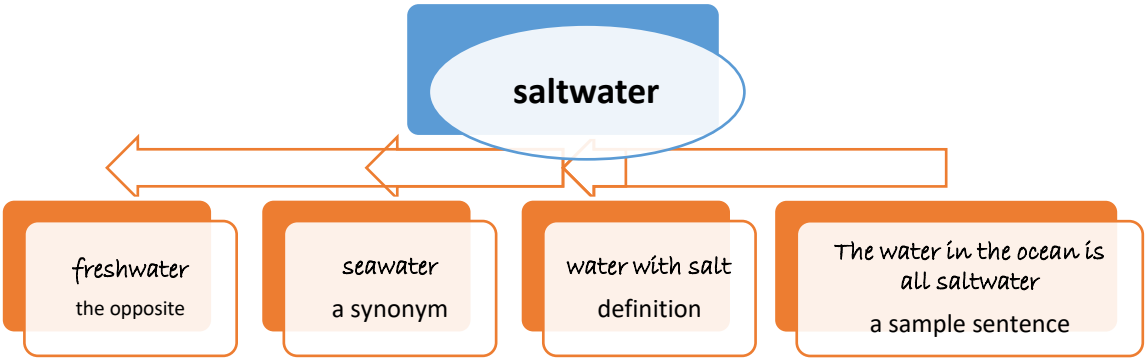
Because cytokinesis usually occurs in conjunction with mitosis, “mitosis” is often used interchangeably with “mitotic phase.” However, there are many cells where mitosis and cytokinesis occur separately, forming single cells with multiple nuclei. This occurs most notably

among the fungi and slime molds but is found in various different groups. Even in animals, cytokinesis and mitosis may occur independently. For instance, during certain stages of fruit fly embryonic development, errors in mitosis can either kill a cell through apoptosis or cause mutations that may lead to cancer. The mitotic phase of the cell cycle includes both mitosis and cytokinesis which produces two identical daughter cells.

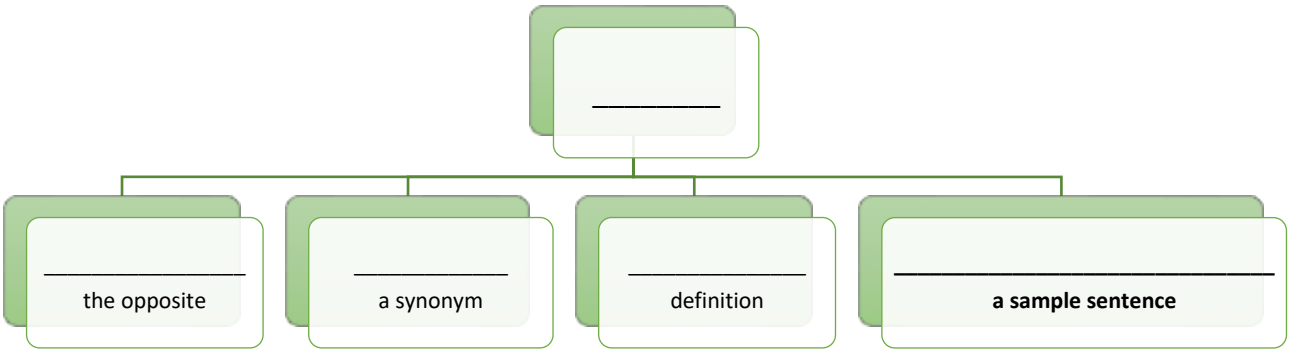
Taken from (Thomas Jefferson National Accelerator Facility - Office of Science Education, 2018)

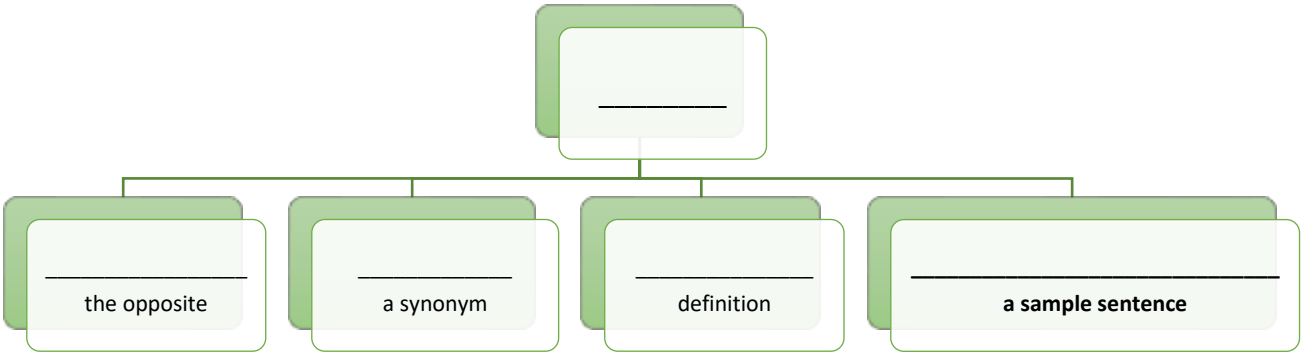
Cell Division through Mitosis- Worksheet 1

1. Read the article and select the two most important words from the text. Write the words in the middle of the mind map. Provide the missing words according to the description given.



An example has been done for you.




_____
_____
the opposite
_____
a synonym
_____
definition
_____
a sample sentence

2. Identify 6 verbs/adjectives related to the main topic of the reading.

_____ _____

_____ _____

_____ _____

3. Explain the meaning of the word “nuclei” found in the first paragraph. Provide one more example of this type of word.

_____

4. Highlight the specialist vocabulary found in the reading. At least 10 words.

5. Identify at least two words you do not how to define, look them up in a dictionary, and then write your own sentence with each one of them.

   ✓ _____ _____

   ✓ _____ _____

6. Think about one short activity that you could use to teach this vocabulary to your students.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix D

Document Analysis on a Checklist

LESSON PLAN

SUBJECT:			**DATE:**	
TEACHER:		**CHECKED BY:**	***(XXXX)***	
GENERAL TOPIC:				
		Yes	**No**	**OBSERVACIONES**
1	**Teaching Objectives**			
1.1	Includes content objectives			
1.2	Includes language objectives			
2	**Learning Outcomes**	**Yes**	**No**	
2.1	Outcome involves the inclusion of content obligatory language			
2.2	Outcome involves the oral/written performance of the students using the content obligatory language			
2.3	Outcome involves the use of some of the vocabulary used in readings.			
2.4	Outcome involves the use of some of the vocabulary used in intensive readings			
3	**Instructional Practice**	**Yes**	**No**	
3.1	Evidence of clear intentional instruction of the vocabulary			
3.2	Strategies that encourage specialist vocabulary assessment			
3.3	Specific criteria that include the use of specialist vocabulary			
RESEARCHER'S COMMENTS				

Appendix E

Class observation checklist

TEACHER'S NAME:		**DATE:**
SUBJECT:	**GRADE:**	**OBSERVER'S NAME:**

CONCEPTUAL BACKGROUND	**YES**	**NO**	**COMMENTS**
Teacher does not hesitate when using the vocabulary			
Clarity of the explanation			
METHODOLOGY			**COMMENTS**
Opening of class focuses on needed vocabulary			
Teacher highlights useful content obligatory language for the class			
Students are provided with a few discourse markers as necessary			
Content obligatory language is provided through an activity			
Lesson is based on reading texts			
Lesson is based on listening tasks			
STUDENTS' OUTCOMES			
Students produce texts in their own words			
Students try to use the learned specialist vocabulary			

RESEARCHER'S REFLECTIONS

_____

_____

_____

_____

Appendix F

In-service teachers Questionnaire

Questionnaire for in-service Science teachers
Help us answer the following questions concerning the workshops held in the past few weeks. This survey is conducted by the research group of the Universidad de la Sabana in the Department of Foreign Languages and Cultures to better understand the influence of working with intensive readings in the CLIL Science classes. This is not a test, thus there will be no "right" or "wrong" answers. We are interested in your opinion, so please provide us with sincere answers to help us in the success of this investigation.

1. According to the CERF, what English level do you have?

- A1
- A2
- B1
- B2
- C1

2. How many years of experience do you have teaching Science in English?

_____
_____

3. Describe your experience in the IRs Workshops.

_____
_____

4. On a scale of 1-6 being 1 the lowest and 6 the highest, how would you rate your intentional teaching of vocabulary in Science class?

1 2 3 4 5 6

5. In terms of specialist vocabulary what do you consider was the most challenging while working with the IRs?

_____

_____

6. How have these workshops influenced your teaching practice?

_____

_____

7. Besides vocabulary, what other aspects of the language do you think you have learned with the Intensive Reading workshops?

_____

_____

8. What kind of readings do you use to teach specialist vocabulary in your classes?

_____

_____

9. How would you rate the effectiveness of IRs as a tool to teach more specialist vocabulary in your classes?

1 2 3 4 5 6

10. How easy or difficult do you think it is to use Intensive Readings in your classes?

_____

_____

11. What kind of strategies have you included in your lesson plans when teaching specialist vocabulary?

_____

_____